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Performance in Post-compulsory Education: Evidence from Vocational and Academic Tracks*

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Abstract

This paper investigates the factors influencing grade performance in two different high school tracks (academic and vocational), including the effect of the amount of work achieved while studying. The empirical strategy analyzes grade progression through the outcomes, passing, repeating and dropping out, conditioning on previous outcomes, and dealing with the endogeneity introduced by the working variable. The analysis is based on a unique Spanish data with information on schooling and labor histories. Findings show that working reduces performance in both tracks, mainly during the first year, although the effects are less detrimental in the vocational path. Additionally, good performance in compulsory education, attending a private high school, or having high-educated parents improve outcomes, particularly in academic high school.

Keywords: Dropout, high school performance, grade progression, youth employment, control function.

JEL codes: I20, I21, J24.

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1 Introduction

Human capital investment is considered an essential determinant of future labor market outcomes, such as life-cycle earnings or employment probabilities[1]. For this reason, school dropouts are a concern for policymakers in most countries, and Spain is not an exception. In particular, Spain presents one of the highest early school leavers rate among European countries. According to Eurostat, this rate, defined as the percentage of people aged 18-24 years old with at most compulsory schooling and who are not receiving any education or training, has been near to 30% over the last decade, while the European average was about 14-15%.

Given this framework, decreasing the early school leavers rate, widely regarded as the official dropout rate, has become an important objective for Spanish educational authorities. However, previously to any policy intervention, it is necessary to understand the factors that influence the decision of dropping out. With respect to this, the early school leavers rate includes two different types of dropouts. First, individuals who dropped out of compulsory school and, so, they have primary education as their maximum schooling level. Second, individuals who did complete compulsory schooling but they did not achieve further education. In Spain, most of the total early school leavers belong to the second group[2]. Moreover, within this group, most individuals are post-compulsory dropouts, and a smaller proportion are real early school leavers (that is, individuals who left education after completing compulsory schooling)[3]. This suggests that a remarkable proportion of the official dropout rate is originated in post-compulsory education.

According to that, in this paper, I analyze individual performance in post-compulsory education. In particular, I explore the impact of individual, family and school characteristics potentially influencing grade outcomes in high school, which is the first educational level following compulsory schooling. In addition, since individuals enrolled in high school belong to the working-age population, I investigate the effect of working while studying on performance. Moreover, the analysis is made separately for the two tracks (academic and vocational) available in high school[4]. The academic track offers general education, predominantly oriented to the access to the tertiary level, while the vocational track gives a specific professional qualification in order to enter the labor market. As these paths differ in the education provided, I explore whether the determinants of the grade progression have or not different effects. For instance, working while in high school may be detrimental if it implies less time to study, or it may be positive, if it motivates individuals

[1] See, for instance, Card (1999), Murnane et al. (2001), Heckman et al. (2003), Harmon et al. (2003), and Belzil (2007).

[2] According to the Spanish Ministry of Education, in 2005, around 81% of the early school leavers had compulsory education as their maximum schooling level (MEC (2006), page 224).

[3] Of a cohort of individuals completing mandatory schooling, about 5% was never engaged in post-compulsory education. These data, subsequently used in the empirical analyses, are described in detail in Section 3.

[4] By school tracking I refer to an education system where students are allocated to different tracks at some stage. These tracks are separate divisions in the education process.

to study harder to achieve a future labor career. The net effect, positive or negative, may be different depending on the track. In vocational high school, where the education provided is more labor-oriented, the working activity may be less detrimental, if it allows applying the knowledge acquired in the classroom. Therefore, from a policy perspective, understanding the factors that affect high school performance and whether their effects differ by track, it is of central interest, since this is the first step to design appropriate measures to reduce the official dropout rate.

There is a broad literature that analyzes high school performance and the dropout decision. In general, researchers agree about the positive effect of parental background: people with high educated parents, from high income households and living with both parents have a lower probability of dropping out of high school (see, for instance, Cameron and Heckman (1998), Eckstein and Wolpin (1999), Nguyen et al. (2001), Dustmann (2004), Bradley and Lenton (2007)). Some studies also emphasize that individuals with lower motivation or worse performance in the preceding schooling levels are more likely to drop out (Eckstein and Wolpin (1999), Nguyen et al. (2001), Bradley and Lenton (2007)). Other authors find that family background and previous performance have different effects on the probability of graduating from each track (Cappellari, 2004), and that people taking academic courses are less likely to drop out (Bradley and Lenton, 2007). With respect to the effect of working while attending school, the evidence is mixed. Some studies obtain small negative effects on performance (Eckstein and Wolpin (1999), Tyler (2003), Stinebrickner and Stinebrickner (2003), Parent (2006), Dustmann and van Soest (2007)), while others find no negative or even positive effects for moderate amounts of employment (Ruhm (1997), Rothstein (2007), Montmarquette et al. (2007)). Furthermore, some authors find that the working experience has positive effects on future economic outcomes (Ruhm (1997), Light (1999)), although Hotz et al. (2002) and Häkkinen (2006) obtain that, after controlling for unobserved heterogeneity, those positive effects disappear. Regarding Spain, in general, there are few papers analyzing individual performance and many of them focus on schooling levels different from high school[5]. For the latter, previous works analyze the role of family background and youth unemployment on the decision to enter post-compulsory education (Petrongolo and Segundo, 2002), and the effect of life-cycle earnings on high school and tertiary education choices (Lopez-Mayan, 2010).

Therefore, this paper presents three contributions to the existing literature. First, it explores the different effects of employment on performance depending on whether students attend a vocational or an academic track, which prior work do not consider. Second, it adds to the still very scarce literature analyzing the impact of individual, family and school variables on high school performance in Spain. Third, it presents evidence on the effect of working on achievement for Spain, a country not analyzed previously[6].

[5]For instance, Zinovyeva et al. (2008) and Anghel and Cabrales (2010) for compulsory and primary education, respectively; and Dolado and Morales (2009), or Lassibille and Gomez (2008), for higher education.

[6]Most of prior research analyzing the impact of working on performance uses data from USA (Ruhm (1997),

For the purpose of this paper, I use a unique micro-dataset elaborated by the Spanish Statistics Institute in 2005 (*Survey on Education and Labor Market Transitions*), which contains a representative sample of individuals who completed compulsory education in 2001. This database provides information on schooling and working decisions during the following four years, thus, covering the period corresponding to high school. Using these data, it is possible to construct the history of high school grade progression for each individual. In particular, in each grade, performance is measured by the following three mutually exclusive outcomes: passing, repeating, and dropping out. Given this framework, the empirical strategy considers a duration-based approach, where grade performance is sequentially analyzed using probability models, and conditioning on previous outcomes. Since there may exist unobserved individual characteristics affecting simultaneously the working activity and the effort to progress in a high school track, the analysis deals with that heterogeneity by considering a broad set of explanatory variables and using the control function method for estimation.

The descriptive analysis shows that there is a non trivial percentage of students working at least one month while they are attending high school, specially in the vocational track. This rate ranges from 8% to 21%, and from 19% to 39%, in academic and vocational high school, respectively, depending on the grade and on whether students are or not repeating that grade.

Results from the control function estimation show that being a female student, attending a private high school, having high-educated parents, performing well in compulsory education, and passing first grade at the first attempt, have positive effects on grade progression. These positive effects are stronger in the academic track. I find that the working activity during high school, measured as the number of school months worked, reduces performance, specially during the first time that students are enrolled in first grade. Results also show that this negative impact is less detrimental in vocational high school. In particular, one additional month worked decreases the probability of passing by -0.18 and -0.08, respectively, in academic and vocational high school. In addition, I find that not controlling for unobserved heterogeneity understates the impact of the working variable on schooling outcomes.

The detrimental effects of youth employment on high school achievement obtained in this paper are in line with the negative impact found by some previous studies. Nevertheless, my results suggest that the impact is not homogeneous across tracks. Moreover, the lower effect estimated for vocational high school may be reflecting that there is a complementarity between the more work-oriented education provided in this track and the knowledge acquired in the labor market.

The rest of the paper is organized as follows. In the next section, I describe the Spanish

Eckstein and Wolpin (1999), Tyler (2003), Rothstein (2007), Buscha et al. (2008)). Some exceptions are Parent (2006) and Montmarquette et al. (2007) that use data from Canada, and Dustmann and van Soest (2007) using data from UK.

education system. In Section 3, I discuss the data, presenting a descriptive analysis. In Section 4, I explain the empirical strategy, the variables and the estimation method used in the analysis. In Section 5, I discuss the headline results and several robustness checks, and Section 6 concludes.

2 Institutional background

In Spain, since the education law of 1990 (*Ley Orgánica General del Sistema Educativo*), compulsory schooling covers ten years, up to the age of sixteen. The mandatory diploma allows access to high school (post-compulsory education), where an individual can choose between attending the academic or the vocational track (see Figure 1). After completing the high school level, students can enter tertiary education, which includes university and vocational college. Access to university requires to hold the academic high school diploma and to pass a general (not university-specific) test. Entry into vocational college is direct from the academic track, while it requires to pass a specific training course if candidates hold a vocational diploma. Since this paper is focused on high school education, next, I explain the main characteristics of the two available tracks[7].

On the one hand, academic high school comprises two grades, where individuals receive general education, which is organized through common and specific subjects. The latter vary with the specialization field (arts; health and natural sciences; technology; or social sciences) chosen by each student. Progressing to the second grade requires to pass all the first-grade subjects or to fail up to a maximum of two (in this case, the student must retake the negatively assessed courses). Otherwise, it is necessary to repeat the whole grade. The academic diploma is obtained after passing all first- and second-grade subjects. In total, students cannot spend more than four years in this track.

On the other hand, vocational high school provides technical education through programs of one or two grades in a wide range of fields, such as agriculture, forestry, fishery, manufacturing, health, building, clerical support, etc. Programs include several school-based modules to give theoretical knowledge, and a final three-month module of workplace training, which is intended to develop work-related skills. In two-grade programs, students can progress to the second year if they passed all first-grade modules or if they fail courses equivalent up to a twenty-five percent of the duration of the first-grade modules (in this case, they must retake the failed courses). For each module, students can take the exam a maximum of four times. The vocational diploma is obtained after passing all modules (including workplace training).

The schooling system allows attending academic high school after completing the vocational track and vice-versa. In addition, it is possible to move between tracks, although in practice, this is very rare because students would have to start the new track almost from the beginning, given the restrictions to waive subjects of the origin track.

[7]For a complete description of the Spanish schooling system, see EURYDICE (2011).

Finally, high school education can be provided by public, semi-private or private schools. Semi-private schools (*colegios concertados*) are private institutions publicly-funded through agreements with educational authorities. Therefore, individuals can attend high school education free of charge in both public and semi-private schools.

3 Data

The data used in this paper come from the *Survey on Education and Labor Market Transitions*, a unique data-set produced by the Spanish Statistics Institute in 2005[8]. The objective of this survey was to know the education and labor decisions of individuals who completed any non-university educational level at the end of the school year 2000/2001. For the purpose of the paper, I use the sample of individuals who finished compulsory education in 2001. They were interviewed in 2005 to collect schooling and working information of the previous four years, since graduation from compulsory school, and, therefore, data cover the period corresponding to high school education. In particular, the data-set contains the following information:

- **Personal characteristics.** Date of birth, gender, nationality, mother and father's education and province of residence.

- **Education.** With respect to compulsory schooling, individuals report the age at which they finished this level and the type of school attended. Regarding post-compulsory education, on a yearly basis, the survey asks about the decision of attending or leaving school. In the first case, people indicate the kind of track and program chosen, the grade and the type of high school attended, and whether they graduated at the end of the school year.

- **Work.** On a monthly basis, all individuals are asked about their employment or unemployment status. If they work, they report whether the job is part-time or full-time. In addition, a questionnaire on the job characteristics is asked to those individuals who had a full-time job at the moment of the interview or who had had a full-time job lasting at least six months in the previous four years. Individuals have to fill in as many questionnaires as times they are in any of the previous situations[9].

3.1 Sample

The sample used in the empirical analysis contains 7,817 individuals. It is obtained after imposing some selection rules to the initial sample of 8,098 individuals. These rules are explained

[8] *Encuesta de Transición Educativo-Formativa e Inserción Laboral.*

[9] The questions about the job refer to the activity of the firm, occupation, net monthly wage on an interval basis, type of contract, hours worked, required degree, starting and finishing dates, and the means that the individual used to find the job.

in Appendix A and, together, they imply to eliminate only 281 individuals (3.5% of the initial sample)[10]. Table 1 contains the description of the final sample. As we can see, 54% of individuals who completed compulsory education in 2001 are females. Around 72% obtained the mandatory diploma at sixteen years old (so, they graduated on time), while 20% and 8% needed one and two years more, respectively, to finish compulsory school. Most individuals attended compulsory education in public (62%) or semi-private (33%) schools, while very few went to a private institution (5%)[11]. With respect to parents' background, we can observe that more than half of individuals present parents with compulsory education as their maximum schooling level, while 22% and 17% have a father or a mother, respectively, holding a tertiary degree. Note, also that the percentage of people who report not knowing parents' education is not negligible (8% and 11% for mother and father, respectively). Finally, the last rows of the Table show the distribution of the region of residence when individuals finished compulsory schooling. Regarding this, just commenting that the survey is representative at the regional level.

As a previous step in the analysis of high school performance, it is important to examine to what extent individuals attend this educational level after finishing compulsory schooling. Regarding this, selection will not be a big concern in the analysis because most students decide to attend high school. In particular, only 5% of people were never enrolled by 2005, four years after obtaining the compulsory diploma. Among those who attended high school education, Table 2 shows that, at least once between 2001 and 2005, around 79% and 15% followed the academic and the vocational track, respectively. The remaining 6% of students attended both tracks, that is, they were enrolled at least one year in academic high school and another year in vocational high school. Finally, of the total students attending the vocational track, about 29% were enrolled in one-grade programs.

3.2 High school performance

Although this data-set is the only source of information about both schooling and labor histories of young people in Spain, it lacks data on student scores. However, as I explain here, the survey provides other pieces of information that allow overcoming that potential limitation and constructing the history of individual high school progression. In particular, I use the information available, in a yearly basis, about the track and grade attended. The way I proceed is as follows. I consider three schooling outcomes, which are mutually exclusive possibilities: passing, repeating, and dropping out of a grade at the end of each school year. These outcomes are not directly asked to individuals but they can be inferred by observing the track and the grade attended over two

[10] I have checked that this does not generate differences in the characteristics between the two samples (Table is available upon request).

[11] These numbers are in line with the percentages of individuals who completed compulsory education in public, semi-private or private schools in 2001, which can be computed using the information available at the website of the Spanish Ministry of Education (http://www.educacion.gob.es/horizontales/estadisticas).

consecutive school years (remind that the academic track has two grades while vocational high school is organized in one or two, depending on the program followed). Specifically, if an individual enrolled in first grade in one track is observed in second grade in the next year, I infer she passed first grade. If she is enrolled again in first grade in the same track, then, she repeated. Finally, if she was not attending education or if she was enrolled in a different track, then, I conclude she had dropped out of first grade. I follow the same procedure for individuals enrolled in the last grade, with the only difference that, in this case, they are asked directly whether they obtained or not the high school diploma at the end of that school year, and, therefore, whether they passed second grade (this question is also asked to individuals enrolled in one-grade vocational programs). For those who did not obtain the diploma, I observe their schooling choice in the next year to infer whether they repeated the last grade or dropped out. With this procedure, it is possible to build the individual history of grade progression[12].

Using this information, in the rest of this Subsection, I present a preliminary analysis of performance. Firstly, the graduation rate for the pool of individuals attending high school is around 77%. This rate is computed as the ratio between the number of individuals who obtain a diploma and the number of individuals attending first grade. By track, the graduation rate is higher in academic than in vocational high school (78.80% and 70.10%, respectively).

In addition, Tables 3 and 4 provide a detailed description of the grade progression in academic and vocational high school, respectively. In these Tables, Panel A shows the distribution of the schooling outcomes in first grade, for the pool of individuals enrolled by first time and for the subset of students repeating that grade. Similarly, Panel B presents these distributions for the pool of individuals who are enrolled in second grade. Moreover, for those who drop out of a grade, I report the re-enrollment rate, computed as the share of individuals who re-enter the track at some time. Finally, note that, in some cases, I also include a fourth outcome called *failing*, which takes value one if a student enrolled in last grade in the school year 2004/2005 does not obtain the diploma. I consider this outcome for the sake of completeness, because for students enrolled in last grade in the last sample year, I know whether or not they obtain the diploma, but, if they do not graduate, I do not observe whether they repeat or drop out.

As we can see, around 80% of individuals enrolled in academic high school by first time passes to second grade in the next year. Another 13% fails and repeats first grade, while about 7% decides to drop out. Therefore, many students failing once first grade decide to try again. However, among repeaters, the percentage who passes is lower (73%) and the drop out rate is higher (20%), reflecting that, after a second time enrolled in first grade, if results are bad again, students are less

[12]Students enrolled in first grade of the academic track or in first grade of a two-grade vocational program during the last school year of the sample (2004/2005) are right-censored to construct their schooling progression, and, for this reason, they are not included in the final sample. This implies to eliminate only 128 individuals, around 1.6% of the initial sample (see Appendix A).

motivated to enroll a third time, and most decide to drop out. Then, Panel B shows performance for all individuals who pass first grade, by first time or after repeating (5040 and 580 individuals, respectively), representing 89% of the total individuals enrolled in first grade. The share passing second grade at the first attempt is around 74%, while 23% repeats, and only less than 3% drops out. This suggests that, since graduation is closer, most students who fail decide to try again. Nevertheless, among repeaters, the graduation rate is fourteen percentage points lower (60%). In addition, it seems that, compared to first grade, the percentage of individuals repeating twice is higher (around 17%), although it should be noted that for 20% of individuals is not observed whether they repeat or drop out.

In the vocational track, in general, individuals perform worse than in academic high school. This is finally reflected in the lower graduation rate shown above. However, we can also detect some interesting differences regarding grade progression. Although the percentage passing first grade (or obtaining a one-grade diploma) at the first attempt is lower than in academic high school (66% vs. 80%), repeaters seem more motivated, since the proportion passing is higher (71%) and similar to the corresponding percentage in the academic track. In addition, the dropout rate of first grade takers is 16%, higher than in academic high school (7%). In second grade, however, the percentage obtaining a diploma at the first attempt (around 78%) is higher than in the academic track (74%)[13]. We can also observe that the share of repeaters in second grade is always lower in vocational high school, while the percentage of dropouts is higher, although this conclusion should be drawn cautiously, since there are individuals censored, specially among repeaters.

Finally, as Tables 3 and 4 show, re-enrollment is a rare event in both tracks, mainly after dropping out of a vocational program.

4 Empirical strategy

Given the characteristics of the high school education in Spain, explained in Section 2, and the previous evidence on grade progression, I consider that a duration-based approach arises as a natural empirical strategy for the analysis of performance. In particular, I explore the determinants of high school outcomes on a grade basis, as individuals progress through the high school track. Therefore, for each track, the analysis consists of the following steps. The starting point is the pool of individuals enrolled in first grade by first time, independently of the school year when they were enrolled. In the second step, I analyze the determinants of performance conditional on having repeated first grade, that is, for the subsample of first-grade repeaters[14]. Then, the third step considers the pool of first-grade survivors, that is, the group of individuals attending second

[13] Note that the number of individuals who passed first grade (1238) is higher than the number enrolled in second grade (925) because there are 313 individuals who complete a one-grade program.

[14] For individuals attending a one-grade vocational program, the analysis finishes in the second step.

grade conditional on having passed first grade, both at first and second attempt. In the last step, I examine performance conditional on having repeated second grade (subsample of second-grade repeaters). In the analysis, I assume that dropping out of a track is an absorbing state because, as shown in Tables 3 and 4, re-enrollment in the same track is a rare event, specially in vocational high school. Nevertheless, if an individual drops out of the academic (vocational) track and, after that, she is enrolled in first grade in the vocational (academic) track, she is included in the pool of first grade students for the performance analysis in vocational (academic) high school. In this way, this grade-based approach provides a complete analysis on how individual, family and school characteristics affect high school outcomes.

In the first three steps of the analysis, performance is measured through the three possible schooling outcomes explained previously: passing (or obtaining the diploma, for individuals in last grade), repeating and dropping out. In the last step, and based on the evidence shown in the last columns of Panel B of Tables 3 and 4, I consider only two outcomes (obtaining or not the diploma) in order to keep in the analysis the high number of second grade repeaters censored in their repeating-dropping out decision.

According to this framework, in each step, the determinants of the schooling outcomes are analyzed by using probability models. Let y_{is} denote a variable taking on the values $\{1, ..., J\}$, where $i = 1, .., N$ indicates individual and $s = 1, ..., 4$ refers to the step of the analysis. Let X_{is} denote the set of explanatory variables, which may include individual stage-invariant characteristics (x_i), which do not take different values for different steps of the analysis (such as gender), and stage-varying regressors (w_{is}), which may take different values (such as the working activity). Let B_{js} denote the vector of parameters, which is allowed to vary by schooling outcomes and step of the analysis.

From stages one to three, I consider a multinomial probability model with $J = 3$, and where $j = \{1, 2, 3\}$ corresponds, respectively, with the outcomes passing, repeating and dropping out. In particular, in each step, the multinomial model can be defined as follows:

- First grade, first attempt ($s = 1$): $p(y_{i1} = j) = F_j(X_{i1}, B_{j1})$
- First grade repeaters ($s = 2$): $p(y_{i2} = j \mid y_{i1} = 2) = F_j(X_{i2}, B_{j2})$
- Second grade, first attempt ($s = 3$): $p(y_{i3} = j \mid y_{i1} = 1 \text{ or } y_{i2} = 1) = F_j(X_{i3}, B_{j3})$

In stage four, I use a binary specification where $j = \{1, 2\}$ corresponds, respectively, with the outcomes obtaining and not obtaining the diploma:

- Second grade repeaters ($s = 4$): $p(y_{i4} = j \mid y_{i3} = 2) = F_j(X_{i4}, B_{j4})$

$F_j(X_{is}, B_{js})$ is the cumulative distribution function of the logistic distribution, yielding a multinomial logit model in steps one to three, and a binary logit specification in step four. As

the set of variables does not include alternative-varying regressors, I normalize $B_{1s} = 0 \ \forall s$ for parameter identification. This analysis is made separately for academic and vocational high school.

4.1 Explanatory variables

Following previous literature, I assume that high school progression is a function of variables measuring personal and family attributes, track and school characteristics, and also the working activity during high school. As it is explained above, this set of variables comprises stage-invariant and stage-varying regressors. In Appendix B.1, I provide the exact definition of all the covariates. In addition, I also present two tables, one for each high school track, with descriptive statistics of these variables, by schooling outcomes and step of the analysis.

Regarding the stage-invariant regressors, I consider gender, both parents' schooling level, the age when a student finished compulsory education, the type of school where an individual obtained the mandatory diploma, and the entry delay in high school. Although, as we can see in Tables B.1 and B.2, these variables are correlated with high school progression, the inclusion of some of them needs additional justification. Parents' education is considered as a proxy for the socioeconomic status of the family, which is a determinant of human capital accumulation. The analysis of high school performance requires also to control for the academic results in the previous schooling level, as they capture individual ability and motivation to study. As the survey does not provide scores for compulsory education, the age when a student finished that schooling level is considered as a good proxy, since it is likely that repeating is the main explanation to obtain the compulsory diploma with more than sixteen years old[15]. Regarding this, I distinguish not only whether students graduated on time (at sixteen years old), but also if they finished one or two years later (at seventeen or eighteen years old), since, as shown in Tables B.1 and B.2, these variables are associated with different high school performance. The type of compulsory school is included to account for the effect of differences in the institution quality and in family income on high school outcomes (for instance, Tables B.1 and B.2 show that students from public schools perform worse). Finally, the entry delay in high school measures if an individual did not attend a given track right after completing compulsory schooling. As we can see in Tables B.1 and B.2, the percentage of students with entry delay is higher in vocational high school, reflecting that this track is not the first option. Indeed, this suggests that a fraction of students attends vocational education after dropping out of academic high school or after participating in the labor market. However, unexpectedly, this delay is correlated with better schooling outcomes. Thus, it will be interesting to analyze whether this result holds after controlling for other covariates.

The rest of regressors included in the probability models are stage-varying. In particular, I

[15]Other reasons to suffer delay in school progression might be health problems or moving to a new town, but they are clearly more unlikely.

consider the following variables. First, the type of high school attended each grade, both at the first attempt or as a repeater, because, as Tables B.1 and B.2 show, attending a public institution is associated with poorer performance in both tracks. I also control for the type of program field, with the range of fields varying by track, as students may select into different fields, implying differences in performance. For instance, in Table B.1 we can observe that students enrolled in natural sciences or technology perform better. Third, in second grade, I control for having repeated first grade. Since second grade regressions are estimated conditional on passing first grade, it is important to account for whether an individual passed or not at the first attempt, since this fact will affect subsequent second-grade outcomes, as supported by preliminary evidence from Tables B.1 and B.2, specially for academic high school. Fourth, in first-grade regressions for vocational high school, I also consider whether individuals are enrolled in a one-grade program, in order to control for potential self-selection into that type of programs.

Finally, the vector of stage-varying covariates also includes the working activity while attending education. This variable deserves attention in the analysis of performance in high school because, in this educational level, students are part of the working-age population (all they are sixteen years old or more) and they can decide to enter the labor market while they are studying. The effect of the working activity could be detrimental for performance if youths have less time to study, or positive if it makes individual more responsible and motivates them to study harder to achieve a future labor career.

In my analysis, the working variable is the total number of school months that an individual worked while she was attending a grade. In Spain, the school year starts around half September and finishes about half June. However, to obtain the working activity, I consider only as school months those from October to May (both included). The reason is that the survey provides employment status on a monthly basis. Thus, if a student worked some days in June because she started a summer job as soon as the school year finished, or in September, because she was working before starting the next school year, these situations are registered as one month's work. Therefore, to minimize this measurement error in the actual labor activity during the school year, I exclude June and September to compute the number of school months worked (see Appendix B.1 for more details)[16].

In order to assess whether the labor activity during school months affects performance, I present a descriptive analysis on this variable. In Table 5, I show the percentage of people working any amount of school months with respect to the individuals enrolled in a grade, including both first takers and repeaters. I also compute these percentages after splitting the sample by schooling outcomes. From this Table, I can highlight several facts. First, there is a non trivial rate of students

[16]This approach of defining a narrow school year to obtain the working activity is also used by Ruhm (1997) or Rothstein (2007).

working while attending high school, specially in the vocational track. Second, within a track, the proportion of individuals working is larger among repeaters than among students enrolled by first time. Third, in both tracks, comparing first takers and repeaters, we can observe that employment presents a rightward shift between first and second grade, reflecting that people are more likely to be employed as they age. Lastly, the correlation that emerges between performance and working activity is different in each track. In particular, for each grade, a clear increasing gradient runs from passing to dropping out in academic high school, while in vocational high school, the gradient decreases from passing to repeating and, then, increases from repeating to dropping out.

This preliminary evidence showing that the working activity is associated with poorer performance (specially in academic high school) is also found in the bottom part of Tables B.1 and B.2, which report the mean and the standard deviation of this variable. In academic high school, within a grade, the average number of school months worked presents an increasing negative correlation with schooling outcomes. In vocational high school, nevertheless, this increasing pattern is clear when we compare the outcomes passing and dropping out, but it is not true for repeating, which always shows the lowest average number of months.

To complete the descriptive analysis, Figures 2 and 3 present the histograms of the distribution of the number of school months worked conditional on having worked at least one month, separately for academic and vocational high school, respectively. I also show separate histograms by grade and attempt (first time or repeaters). In all graphs, the number of months is quite uniformly distributed between one and seven, with a peak at eight months[17]. The main difference between academic and vocational high school is that the latter presents smoother distributions, with a lower amount of density at eight months.

As final comment on the explanatory variables, all the regressions include the provincial per capita income to control for the fact that students in areas with lower wages can be more motivated to perform better in high school than students living in high-wage areas, where working while attending school can be a more attractive option.

4.2 Endogeneity of working while in high school

Individuals can have different reasons to work while they are attending high school. For instance, they may need extra income, or they want to enhance labor skills to complement formal education, or they are not motivated to finish high school. In any case, it is nonrandom who decides to work. Indeed, the effort to progress in high school and the working activity are two simultaneous decisions that can be influenced by unobserved individual characteristics. For example, individuals with low ability or motivation to study may decide to work because they do not expect to complete

[17]Note that eight is the maximum number of school months that a student can work in a school year.

high school. On the other hand, individuals with high ability or motivation may decide to work in order to have a valuable labor experience once they finish their education. This nonrandom decision generates endogeneity problems that can yield biased estimates of the effect of working on performance.

In the preliminary analysis of the data, I find evidence in favor of a negative effect of working on grade outcomes. However, this impact includes the selection problem explained above. Therefore, drawing appropriate conclusions about the effect of the number of school months worked requires to control for unobserved heterogeneity. Regarding this, first, all regressions account for the broad number of observable variables previously discussed. And, second, I instrument the number of school months worked with variables capturing the labor market opportunities for young people. Previous literature that deals with endogeneity using instrumental variables techniques has considered also this type of instruments, since it is reasonable to assume that they do not have a direct effect on individual performance. Most part of prior research uses the local unemployment rate (see, for instance, Ruhm (1997), Parent (2006), Dustmann and van Soest (2007), and Rothstein (2007)), but it also considers measures of residence in a metropolitan area (Ruhm, 1997), average wage rate for teens (Rothstein, 2007) or state laws for teen labor (Tyler (2003), Rothstein (2007)).

In this paper, I use a different set of variables capturing the local labor market possibilities for young people in each school year. In particular, I consider the annual youth activity rate and the relative amount of tourists during school months in each year, both measured in the student's province of residence (see Appendix B.2 for more details). The youth activity rate captures to what extent young people participate in the local labor market, reflecting whether individuals live in an economically strong area. On the other hand, the second instrument measures the relative importance of tourism in the province of residence during the school months. In this way, I try to capture the labor opportunities of the type of jobs that an individual who is working and attending school at the same time may search for. Finally, it should be noted that both instruments present geographic and time variation since each survey's respondent is matched to these data according to her province of residence and the year when she is enrolled in a given grade.

The relevance of the instruments can be assessed by examining the estimates from a regression of the number of school months worked on the set of instrumental and explanatory variables. For academic and vocational high school, respectively, Tables 6 and 7 present the results of estimating that regression for each step of the analysis. All estimates are obtained after controlling for the whole set of regressors. Regarding the instruments, on the one hand, findings show that an increase in the youth activity rate implies a significantly higher number of school months worked in academic high school, while in the vocational track, this positive effect is significant only for individuals taking first grade by the first time[18]. On the other hand, the relative amount of

[18]Note that, since the years covered by the data correspond with an expansion period, an increase in the activity

tourists in the province during school months also affects positively the working activity, although only the estimates from second-grade regressions are significant, with stronger effects in vocational high school. This suggests that a higher amount of tourists increases the job opportunities in the province, rising youth employment intensity. The F-test of joint significance shows that the local activity rate and the distribution of tourists are strong instruments in the four regressions for the academic track and in the two first-time regressions for vocational high school. The F-tests from regressions for vocational repeaters indicate that the instruments are a bit weak, mainly attributable to the small number of students belonging to those groups[19].

Finally, it should be noted that, since the working intensity in first grade affects the schooling outcomes, first-grade repeater is potentially an endogenous variable in the regressions corresponding to second grade. The reason is that individual unobserved factors influencing the working activity will affect the probability of repeating first grade, and, therefore, the outcomes in second grade. The lack of instrumental variables does not allow controlling appropriately for this source of endogeneity in second grade regressions. Nevertheless, as it is shown below, I make different checks to assess to what extent it affects the results.

4.3 Estimation method

The method used for estimation is control function (CF)[20]. This approach allows estimating nonlinear models with endogenous variables more easily than with standard instrumental variable (IV) techniques. The CF method treats endogeneity as an omitted variable problem, building on the intuitive idea that it is possible to obtain unbiased estimates of an endogenous variable by including in the regression a function that controls for unobserved characteristics. This control variable is "an attempt to approximate the influence of the omitted variables" (Cameron and Trivedi (2005), page 37).

The CF method has two stages. The first one consists of obtaining the OLS residuals from the regression of the endogenous variable on the set of instrumental and explanatory variables. These residuals are the function that will control for omitted characteristics affecting the decision of working. This step requires a continuous endogenous variable. Regarding this, based on the descriptive evidence shown in subsection 4.1, the number of school months worked can be treated as continuous. Then, the second stage consists of estimating the regression of interest including the endogenous regressor, the rest of covariates, and the residuals. The estimates are obtained reparameterized by the correlation term of the errors from the two equations, although the fitted probabilities are directly useful to obtain marginal effects. The standard errors from the second

rate reflects an improvement of the local labor market opportunities.

[19] Instead of the activity rate, I also estimated first-stage regressions using the youth unemployment rate, but this variable showed a very weak predictive power in both tracks.

[20] This method was initially proposed by Blundell and Smith (1989), and, generalized to semi-parametric models by Blundell and Powell (2003, 2004).

stage are inconsistent due to the uncertainty introduced by using the estimated residuals instead of the true ones, but consistent estimates can be obtained with bootstrap techniques.

In linear models, the CF approach leads to the 2SLS estimator. In nonlinear models, CF provides a consistent estimator of the underlying regression coefficients but, since it is a two-step function, it is asymptotically inefficient relative to maximum likelihood. However, in that type of models, the CF estimator is clearly computationally convenient. Using CF requires to find variables correlated with the endogenous regressor but orthogonal to the error term. Regarding this, as it was explained previously, I consider the youth activity rate and the distribution of tourists as instruments for the working activity while in high school.

5 Results

Before passing to comment the results from the estimation of the probability models, I summarize the main findings from the estimation of the first-stage regressions shown in Tables 6 and 7, because, in addition to assessing the relevance of the instruments, these results are also useful to give insight into the determinants of the decision to work while enrolled. Firstly, father's education has a positive impact on the working activity in academic high school, although only among repeaters, suggesting that fathers promote that their sons work when they perform badly at that track. On the contrary, in vocational high school, father's education has a negative impact, but only significant in the first time in second grade. The effect of the mother's education is positive and is also concentrated in second grade, whereas, in general, in the academic track, its effect is not significant. Second, bad performance in compulsory education, reflected by the age when an individual finished this level, increases significantly the working activity during school months, although only in academic high school. Third, entering the academic track with delay affects the working decision, although the sign of the effect is the opposite between first takers and repeaters. Fourth, repeating first grade clearly increases the number of school months worked in academic high school, while it does not have an effect different from zero in the vocational track. Fifth, attending a one-grade vocational program increases the working activity, while the type of program field, if any, reduces it. In academic high school, the field chosen is only significant among second-grade repeaters. Finally, the results reflect the importance of controlling for provincial income, specially in academic high school, where it affects significantly the working activity.

5.1 Determinants of grade progression

Tables 8 and 9 report the average marginal effects from the CF estimation of the probability models of grade progression in academic high school and vocational high school, respectively[21].

[21] The OLS residuals to control for omitted variables are obtained using the estimates from Tables 6 and 7.

In particular, each Table shows the marginal effects corresponding to the analysis of performance in the two grades, both for the first time enrolled and for repeaters. Remind that, in the multinomial logit specification (columns two to nine), performance is measured through the schooling outcomes passing, repeating and dropping out, while in the binary logit model (column ten), the dependent variable is equal to one if an individual did not obtain the diploma and zero otherwise. Marginal effects are calculated as the sample average of individual marginal effects, and standard errors are computed with the delta method, after obtaining consistent estimates by using fifty bootstrapped replicas[22].

I begin by discussing the effects of the number of school months worked (see first row of Tables 8 and 9). Table 10 compare these effects with those obtained from the estimation without accounting for the endogeneity of the working activity. Results reveal that, in this case, working an additional month while attending high school reduces the probability of passing a grade in both tracks, but the effects are fairly small (around -0.01 and -0.02). At the same time, in academic high school, working one month more rises the probability of both dropping out and repeating. In the vocational track only the probability of dropping out experience an increase, while the effect on repeating is zero, or even negative in the first time in first grade. When I estimate using the control function approach to account for the endogeneity of high school employment, only marginal effects from the estimations for the first time in first grade remain significant, but experiencing a remarkable increase in absolute value. In particular, in academic high school, working an additional month reduces the probability of passing by -0.18 (an effect nine times higher than the previous one), and it increases the probability of repeating and dropping out by 0.10 and 0.08, respectively, when these effects were just equal to 0.01 without using control function. On the other hand, the impact on the probabilities of passing and dropping out in vocational high school is also higher (-0.08 and 0.08, respectively), while the effect on the probability of repeating is not significantly different from zero, disappearing the small negative impact previously found. The fact that the effects of employment, following the first time in first grade, are measured imprecisely might be explained by the potential presence of selection due to dropouts. Since the working activity in the first year increases the probability of dropping out, it is very likely that individuals leaving high school are among those who worked more intensively during the first year. This implies that stayers are relatively more homogeneous in their employment activity, making more difficult to measure precisely the effect of this variable on subsequent outcomes.

To sum up, results show that, after controlling for unobserved individual characteristics, the

[22]Tables C.1 and C.2, in Appendix C, contain the marginal effects obtained without controlling for unobserved heterogeneity. The main difference with respect to the estimates reported in Tables 8 and 9 is a non surprising increase in the significance level of some regressors, since using control function produces larger standard errors. The first year in academic high school there are two additional small changes: the negative effect of finishing compulsory education with eighteen years old is a bit larger, and entry delay does not have significant effect on the probabilities of passing and dropping out.

working intensity during high school is associated with poorer performance in both tracks, specially for individuals enrolled in first grade by the first time, when the effects are also measured very precisely. In line with most of the previous research estimating the impact of working on high school performance, the difference between the estimates with and without using control function suggests that the latter are biased because of selection on unobservables. Specifically, findings show that failing to account for the presence of unobserved heterogeneity understates the effect of the high school employment intensity on performance, implying that the number of school months worked is negatively correlated with unobserved personal characteristics. This suggests that individuals with relatively high ability or motivation to study accumulate more work experience while they are attending high school, and this is detrimental for their achievement. First-stage residuals, which capture the effect of omitted variables, are consistent with this interpretation.

With respect to the effects of the remaining explanatory variables, I find that women perform better than men in all stages of the academic track, while there are not significant differences in vocational high school. Entering into a high school track with delay has a significant, positive effect on performance in the first year, specially in academic high school. This result confirms the descriptive evidence previously found, suggesting that individuals who decide to enroll in a high school track after trying another one or after participating in the labor market are more motivated to study hard.

Looking at the institutional variables, studying in a private high school improves performance by increasing the probability of passing and reducing the probability of repeating and dropping out, and the effects are larger in academic high school. For instance, attending a private institution instead of a public one, increases the probability of passing first grade at the first attempt by 0.14 and 0.07 in academic and vocational high school, respectively[23]. The positive effects are also large and significant in next years in academic high school, but they fade-out in the vocational track. In order to interpret those effects, it is necessary to take into account that this variable may measure differences in the institution quality, but it may also capture the different socioeconomic background and ability of students. Although the latter are partly controlled for by including first-stage residuals, parents' education or type of compulsory school, we would need more information on the characteristics of the high school attended to draw some policy recommendation regarding the quality of public and private high schools.

The effect of having attended a private school in compulsory education is measured imprecisely, although, when it is significant, it improves performance. It is remarkable that individuals who attended compulsory education in a semi-private institution perform worse the first time in the academic track than those who attended a public school.

With respect to parents' education, I observe some differences by track. In particular, in vo-

[23]Note also that the dummy for private high school includes semi-private institutions.

cational high school, these variables do not affect significantly performance, with the exception of some significant effects associated to having a tertiary-educated mother. This lack of precision in the estimates may suggest that people attending vocational high school have a relatively homogeneous socioeconomic background. On the contrary, in academic high school, parents' schooling does affect performance. In particular, I find that those individuals whose parents have high school or more present better outcomes than those whose parents' schooling attainment is primary education or less.

Bad performance in compulsory education, proxied by finishing that level with seventeen or eighteen years old, reduces the probability of passing a grade and increases the probability of repeating and dropping out. The effects are particularly large and significant in academic high school, specially in the second grade. In order to assess the magnitude of these effects, we can see that, on the one hand, they are similar to the impact of the working intensity during the first year enrolled in high school. However, on the other hand, while the effect of the number of school months worked becomes non significant over the next years, the impact of bad performance in compulsory education remains and, even rises in the academic track. Therefore, bad results in compulsory education are not only a factor driving the choice of the vocational track (as shown by Lopez-Mayan (2010)), they also affect considerably the subsequent high school progression.

With respect to the program chosen in high school, some types of fields affect positively performance, although the effects are mainly significant the first time enrolled in the track. For instance, choosing arts or, health and natural sciences, in academic high school improves schooling outcomes compared to be enrolled in the social sciences field. In vocational high school, positive effects are observed for individuals choosing programs that belong to the fields of agriculture, machinery or social services.

In vocational high school, attending a one-grade program reduces performance the first year, increasing the probability of repeating by 0.22 and reducing the probability of passing by -0.18. This may suggest that worse students are self-selected into one-grade programs. However, among first-grade repeaters the effect works on the opposite direction: those enrolled in a one-year program have a lower probability of dropping out. One possible explanation is that, since they are enrolled in a one-grade program, they see graduation closer than repeaters enrolled in a two-grade program, and this pushes them to continue in education.

Finally, having repeated first grade has a strong positive effect on the possibility of repeating second grade, increasing this probability by 0.27 and 0.11, respectively, in academic and vocational high school. In addition, repeating first grade also rises the probability of not obtaining the diploma among second-grade repeaters, although the effect is only significant in the academic track. As explained in 4.1, since being a first-grade repeater is potentially an endogenous variable, below, I present some checks in order to assess the robustness of the results.

5.2 Robustness checks

In this Section, I implement different robustness checks which address potential reservations about the validity of the results presented above. Findings are summarized in Table 11, where, for the sake of brevity, I only present the marginal effects and the standard errors of the number of school months worked[24].

First, I analyze whether not controlling for being a first-grade repeater changes the results presented in Tables 8 and 9, which are summarized in Table 10, in the rows corresponding to the control function estimates. Since the working intensity affects performance, having repeated first grade is likely an endogenous variable in second grade regressions. In particular, there may be unobserved characteristics that induce individuals to work more during high school, increasing the probability of repeating first grade, and creating endogeneity issues in the analysis for second grade. According to this, when repeating first-grade is not controlled for, its effect on second-grade performance may be partly captured through the working intensity. As we can see in the first rows of Table 11, in academic high school, the effect of the number of school months worked on performance in second grade hardly changes after re-estimating without controlling for first-grade repeater. There is only a small increase in the absolute impact on the probabilities of obtaining the diploma and repeating, although the effect on repeating is only significant at 10% level. Moreover, in vocational high school, marginal effects do not experience any relevant change (see first rows of Panel B). Therefore, I conclude that the potential endogeneity introduced by the repeater variable does not seem a very serious concern.

This previous evidence is reinforced with the next check, which belongs to a set of robustness checks that involve limiting the analysis to individuals with relatively homogeneous characteristics, in order to reduce the effects of unobserved heterogeneity. Regarding this, first, I re-estimate second-grade regressions limiting the sample to people who is enrolled in second grade after passing first grade at the first attempt, that is, without including the group of first-grade repeaters. As we can observe in Panel A of Table 11, in the academic track, repeating second grade regressions for this restricted sample leaves results essentially unchanged. In vocational high school (Panel B), marginal effects for the first time enrolled in second grade differ slightly from Table 10, although, like in the headline specification, they are not significantly different from zero. I therefore conclude that the potential endogeneity issues created by including first-grade repeater in the baseline regressions are not driving the results. If any, introducing this variable creates a slightly underestimation of the negative effect of working on performance, which could be interpreted as a lower bound.

In the middle of Panel A and B, I implement a second sample restriction. There may be

[24] Results regarding the rest of variables are available upon request. Note that each check involves computing the corresponding first-stage residuals.

individual unobserved characteristics driving the decision of not attending high school right after completing compulsory education and the decision of working while attending a track. To address this issue, I restrict the sample to people who decided to enroll in high school the year following completion of compulsory schooling. In other words, I limit my analysis to those individuals with a value of the variable *entry delay* equal to zero, and, therefore, I focus on persons with a relatively more homogeneous high school attendance pattern. For the academic track, I find that the results do not differ from those presented in Table 10. For vocational high school, implementing this restriction implies to eliminate relatively more individuals from the initial sample, resulting in a potential change of the sample composition. As it is shown in Panel B of Table 11, the effects of the working activity on the probabilities of passing or dropping out the first year in first grade are a bit larger in absolute value (-0.14 and 0.13, respectively), compared to those from Table 10 (-0.08 and 0.08, respectively). Like in the headline specification, the rest of effects are not significantly different from zero, although in the restricted analysis, standard errors are larger, as the consequence of the smaller sample sizes. Therefore, I conclude that individuals attending the vocational track with and without some year of delay present different unobserved characteristics. The robustness check reveals that this heterogeneity understates the negative impact of the working activity in the first year. Thus, the effects from the headline estimation may be considered as a lower bound.

Finally, although I control for the first-stage residuals and for a broad set of explanatory variables, the presence of unobserved individual ability might still be a concern. To address this issue, in the bottom of Panel A and B of Table 11, I assess to what extent the results are robust to restricting the sample to individuals with relatively homogeneous performance in compulsory schooling. In particular, I focus on the group of students who finished compulsory education with sixteen years old. In academic high school, re-estimating the regressions for this restricted sample does not change the results compared to those from the headline specification. In the vocational track, the effects are also similar, although they are measured quite imprecisely due to the remarkable decrease in sample sizes[25]. According to this evidence, I conclude that unobserved ability is not an important concern for the results.

6 Conclusions

In this paper, I investigate the grade performance of individuals enrolled in high school in Spain. In particular, I analyze how the grade outcomes, passing, repeating, and dropping out, are affected by a set of variables capturing individual, family and school characteristics, and by the amount of work that a student achieves during each grade. The empirical strategy considers a duration-based

[25]Note that results for repeaters are not reported for vocational high school because estimation failed due to the extremely small sizes of these two groups of individuals.

approach, where grade performance is sequentially analyzed, conditional on previous outcomes. The working activity introduces endogeneity issues in the analysis, because there may exist unobserved individual characteristics affecting simultaneously this variable and performance. I deal with that heterogeneity by considering a broad set of observable variables and using the control function method for estimation. Since high school has available two tracks (academic and vocational), which differ in the type of education provided, the analysis is made separately for each of them.

I find that being a female student, attending a private high school, having high-educated parents, performing well in compulsory education, and passing first grade at the first attempt, have positive effects on grade progression, specially in the academic track. The working activity reduces performance, with the more adverse effects taking place during the first time enrolled in high school. The negative impact is found in both tracks, although I obtain that it is less detrimental in vocational high school, what is consistent with the more labor-oriented education provided in this track. In next years, the effect of the working variable is not measured precisely. In addition, I find evidence that not controlling for the endogeneity of the employment intensity understates the impact of this variable on schooling outcomes.

My results suggest that a policy addressed to decrease the working activity while studying will have positive effects on schooling achievement, particularly, if it affects the employment intensity during the first year enrolled in high school. However, although the estimated effects are quite robust to a series of robustness checks, my approach does not fully control for all sources of unobserved heterogeneity. Therefore, it is necessary to be cautious in interpreting the results as causal and, thus, in formulating recommendations to limit the working activity during high school. Nevertheless, findings suggest that policies should be take into account the potential different effect of working on academic and vocational tracks. This paper also adds to the still scarce Spanish evidence about the effect of family background, type of school, performance in compulsory education, and employment on high school outcomes, highlighting the differences between academic and vocational high school. This is an important previous step to design any policy intervention to improve educational achievement of young people. Formulating specific policy recommendations remains as an important issue for future research due to the lack of more appropriate data in Spain. Moreover, one should remember that my findings relate to the young people attending high school between 2001 and 2005, a period of economic growth. In future work, it would be interesting to analyze whether these findings carry over the youth attending high school today, when economic conditions are very different due to the deep crisis.

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Figures

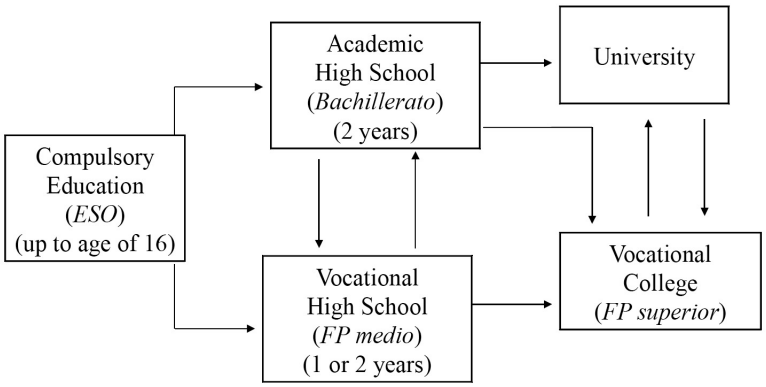

Figure 1: Schooling levels in post-compulsory education

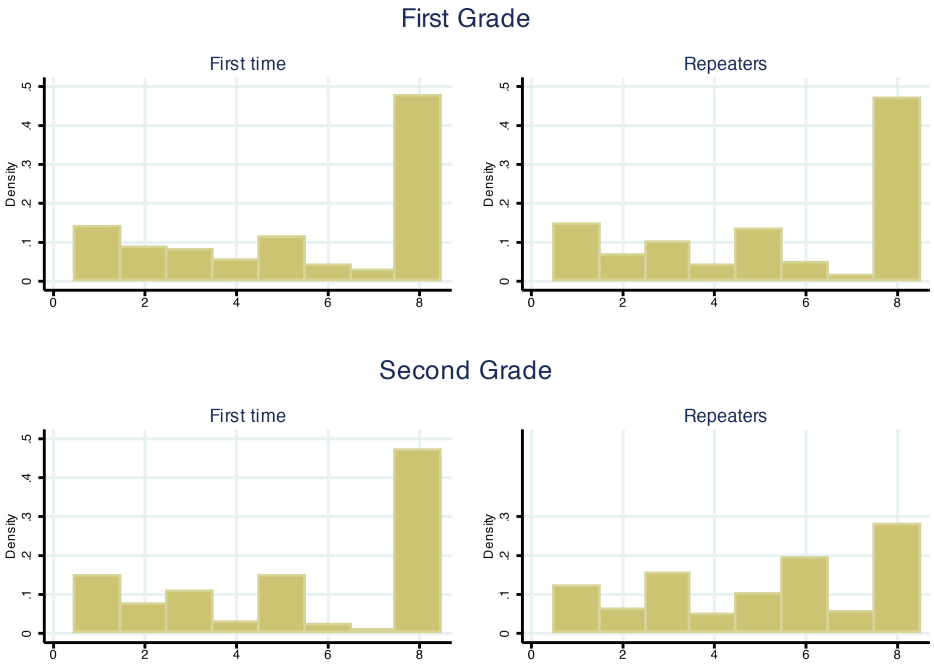

Figure 2: Histograms of the distribution of the number of school months worked conditional on having worked at least one month (Academic high school)

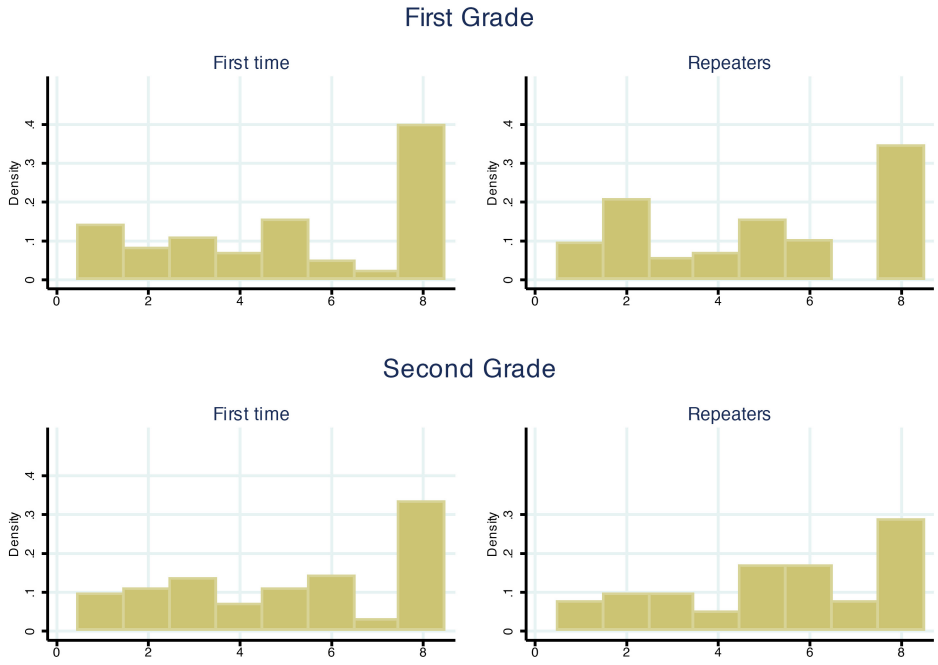

Figure 3: Histograms of the distribution of the number of school months worked conditional on having worked at least one month (Vocational high school)

Tables

Table 1: Sample description (%)

Female	53.93
Age when finished compulsory education:	
16 years old (no delay)	72.43
17 years old (1 year delay)	19.21
18 years old (2 year delay)	8.36
Type of school (compulsory education):	
Public	61.79
Private	4.97
Semi-private	33.24
Mother's education:	
Primary or less	10.76
Compulsory	45.78
High school	17.58
Tertiary	17.40
Don't know	8.48
Father's education:	
Primary or less	9.21
Compulsory	41.16
High school	16.77
Tertiary	21.85
Don't know	11.00
Region of residence:	
Andalusia	21.64
Aragon	2.67
Asturias	2.65
Balearic Islands	1.84
Canary Islands	4.27
Cantabria	1.38
Castilla-La Mancha	4.09
Castilla-Leon	5.60
Catalonia	14.10
Extremadura	2.74
Galicia	6.52
La Rioja	0.61
Madrid	13.09
Murcia	2.82
Navarra	1.30
Basque Country	4.87
Valencia	9.50
Ceuta-Melilla	0.32
Individuals	7817

Percentages obtained using population weights included in the data-set.

Table 2: Schooling choices

	Population weights	Individuals
Only academic track	78.80	5865
Only vocational track	14.95	1143
Both tracks	6.25	445
Total*	100	7453

An individual attends a track if she is enrolled at least one year between 2001 and 2005. *There are 364 individuals in the initial sample who did not attend high school.

Table 3: Grade progression in academic high school

A. FIRST GRADE

	First time		Repeaters	
	%	N	%	N
(1) Passing	79.87	5040	72.59	580
(2) Repeating	12.66	**799**	7.01	56
(3) Dropping out	7.46	471	20.4	163
(re-enrollment rate)	(7.43)	(35)	(3.68)	(6)
Total: (1)+(2)+(3)	100	6310	100	**799**

B. SECOND GRADE

	First time		Repeaters	
	%	N	%	N
(4) Diploma	74.22	4171	59.94	766
(5) Repeating	22.74	**1278**	16.51	211
(6) Dropping out	2.70	152	3.52	45
(re-enrollment rate)	(10.53)	(16)	‡	‡
(7) Failing†	0.34	19	20.03	256
Total: (4)+(5)+(6)+(7)	100	5620	100	**1278**

Sample: 7817 individuals. Distribution of schooling outcomes in each grade, distinguishing if students are enrolled by first time or they are repeating. The re-enrollment rate is the share of individuals who re-enter the track at some time. ‡Re-enrollment is not observable as the 45 individuals dropped out in the last sample year. †Students who report they did not obtain the diploma, but as they are enrolled in the last grade in 2004/2005, they are censored with respect to the repeating-dropping out decision.

Table 4: Grade progression in vocational high school

A. FIRST GRADE				
	First time		Repeaters	
	%	N	%	N
(1) Passing/Diploma*	66.12	1050	70.68	188
(2) Repeating	16.75	**266**	8.27	22
(3) Dropping out	16.18	257	19.17	51
(re-enrollment rate)	(4.67)	(12)	(0)	(0)
(4) Failing†	0.94	15	1.88	5
Total: (1)+(2)+(3)+(4)	100	1588	100	**266**

B. SECOND GRADE				
	First time		Repeaters	
	%	N	%	N
(5) Diploma	77.73	719	60.58	63
(6) Repeating	11.24	**104**	6.73	7
(7) Dropping out	5.73	53	9.62	10
(re-enrollment rate)	(3.77)	(2)	‡	‡
(8) Failing†	5.30	49	23.08	24
Total: (5)+(6)+(7)+(8)	100	925	100	**104**

Sample: 7817 individuals. Distribution of schooling outcomes in each grade, distinguishing if students are enrolled by first time or they are repeating. The re-enrollment rate is the share of individuals who re-enter the track at some time. *Diploma: only for individuals enrolled in a one-grade program. †Students who report they did not obtain the diploma, but as they are enrolled in the last grade in 2004/2005, they are censored with respect to the repeating-dropping out decision. ‡Re-enrollment is not observable as the 10 individuals dropped out in the last sample year.

Table 5: Percentage of individuals working while attending education

A. Academic high school					
	Total	Schooling outcomes			Sample size
		Passing	Repeating	Dropping out	
1^{st} *grade:*					
First time	7.77	5.57	8.78	28.13	6310
Repeaters	14.12	10.52	29.01	21.72	799
2^{nd} *grade:*					
First time	8.92	7.01	11.91	35.86	5601
		Diploma	No diploma		
Repeaters†	20.73	14.32	30.18		1278

B. Vocational high school					
	Total	Schooling outcomes			Sample size
		Passing	Repeating	Dropping out	
1^{st} *grade:*					
First time	19.44	15.16	13.25	43.16	1573
Repeaters	30.88	29.71	26.07	37.17	261
2^{nd} *grade:*					
First time	26.95	26.62	20.68	43.61	876
		Diploma	No diploma		
Repeaters†	39.23	34.20	47.31		104

Sample: 7817 individuals. Population weights. †Performance is measured by the outcomes completing or not high school (*Diploma* and *No diploma*, respectively), in order to avoid eliminating from the analysis the second-grade repeaters censored in the repeating-dropping out decision (see right column of Panel B in Tables 3 and 4).

Table 6: Determinants of student employment during Academic high school (First-stage estimates)

Dependent variable: Months worked while enrolled				
	1^{st} GRADE		2^{nd} GRADE	
	First Time	Repeaters	First Time	Repeaters
Provincial youth activity rate	0.02***	0.02*	0.02***	0.04***
	(0.00)	(0.01)	(0.01)	(0.01)
Provincial distribution of tourists	0.02	0.04	0.03*	0.05***
	(0.01)	(0.02)	(0.01)	(0.02)
Female	0.03	0.09	0.01	-0.08
	(0.06)	(0.20)	(0.06)	(0.13)
Entry delay	1.61***	-0.52***	1.72**	-[‡]
	(0.43)	(0.19)	(0.74)	-
Private high school	-0.05	-0.37**	-0.05	-0.13
	(0.06)	(0.14)	(0.07)	(0.27)
First-grade repeater	-	-	0.30***	0.41**
	-	-	(0.08)	(0.18)
Program field (ref.: Social Sciences):				
Arts	0.17	0.11	0.25	1.54***
	(0.17)	(0.29)	(0.20)	(0.52)
Health and Natural Sciences	-0.00	0.28	-0.02	-0.29***
	(0.03)	(0.18)	(0.05)	(0.10)
Technology	-0.03	-0.15	-0.08	-0.17
	(0.06)	(0.14)	(0.07)	(0.16)
Age when finished compulsory education (ref.: 16 years old):				
17 years old	0.27***	0.02	0.10	-0.09
	(0.08)	(0.17)	(0.09)	(0.17)
18 years old	0.67***	1.12**	0.52***	-0.15
	(0.17)	(0.47)	(0.18)	(0.31)
Type of compulsory school (ref.: Public):				
Private	-0.09	0.71	-0.21*	-0.40
	(0.11)	(0.48)	(0.12)	(0.42)
Semi-private	-0.06	-0.21	-0.03	-0.18
	(0.06)	(0.14)	(0.05)	(0.12)
Father's education (ref.: Primary or less):				
Compulsory	0.04	0.61***	0.01	0.36*
	(0.10)	(0.22)	(0.11)	(0.20)
High school	-0.13	0.45	-0.09	0.35
	(0.12)	(0.27)	(0.11)	(0.22)
Tertiary	-0.13	0.60**	-0.09	0.49
	(0.12)	(0.25)	(0.12)	(0.33)
"Don't know"	-0.00	0.27	-0.03	0.94**
	(0.14)	(0.19)	(0.16)	(0.45)

(*continued on next page*)

Table 6: (continued)

Dependent variable: Months worked while enrolled				
	1^{st} GRADE		2^{nd} GRADE	
	First Time	Repeaters	First Time	Repeaters
Mother's education (ref.: Primary or less):				
Compulsory	-0.09	-0.31	-0.14	-0.37*
	(0.12)	(0.28)	(0.11)	(0.22)
High school	-0.01	-0.09	0.02	-0.39
	(0.14)	(0.32)	(0.11)	(0.25)
Tertiary	-0.08	-0.14	-0.10	-0.59*
	(0.13)	(0.29)	(0.13)	(0.32)
"Don't know"	-0.03	0.12	-0.17	-1.13***
	(0.18)	(0.31)	(0.15)	(0.35)
Provincial per capita income†	0.05**	0.03	0.07**	0.15***
	(0.02)	(0.06)	(0.03)	(0.05)
Constant	-1.11***	-1.09	-1.32***	-2.58***
	(0.30)	(0.82)	(0.47)	(0.74)
Individuals	6310	799	5601	1278
Summary statistics from the first-stage estimation				
R-squared	0.046	0.048	0.038	0.078
Partial R-squared excluding instruments	0.032	0.035	0.022	0.051
F-test of joint significance of instruments	16.81***	4.23**	9.53***	15.63***
(p-value)	(0.00)	(0.02)	(0.00)	(0.00)

OLS estimates. Standard errors clustered by province in parenthesis. Significance levels: *** 1%; ** 5%; * 10%.
‡Regressor not included to avoid multicollinearity. †Provincial income in thousands of euros.

Table 7: Determinants of student employment during Vocational high school (First-stage estimates)

Dependent variable: Months worked while enrolled				
	1^{st} GRADE		2^{nd} GRADE	
	First Time	Repeaters	First Time	Repeaters
Provincial youth activity rate	0.03***	0.03	0.01	-0.03
	(0.01)	(0.02)	(0.01)	(0.06)
Provincial distribution of tourists	-0.00	-0.02	0.05**	0.13**
	(0.02)	(0.03)	(0.02)	(0.05)
Female	-0.17	0.41	-0.12	1.42
	(0.18)	(0.42)	(0.21)	(1.12)
Entry delay	0.19	0.76	0.33	0.11
	(0.17)	(0.50)	(0.26)	(0.77)
Private high school	0.04	0.46	0.48**	-0.81
	(0.16)	(0.41)	(0.23)	(0.68)
First-grade repeater	-	-	0.14	0.34
	-	-	(0.24)	(0.82)
One-grade program	0.49***	-0.13	-	-
	(0.18)	(0.37)	-	-
Program field (ref.: Clerical support):				
Agriculture, forestry and fishery	0.09	-‡	-1.11***	-‡
	(0.43)	-	(0.38)	-
Electrical and electronic trades	0.10	-0.89	-0.80**	-0.84
	(0.23)	(0.54)	(0.31)	(1.36)
Machinery and building	0.21	-0.98*	-0.70**	-0.65
	(0.23)	(0.51)	(0.33)	(1.36)
Textile, wood and handicraft	-0.60*	-‡	-0.40	-‡
	(0.31)	-	(0.52)	-
Social services	0.19	-0.80	0.21	-1.33
	(0.15)	(0.48)	(0.29)	(1.13)
Age when finished compulsory education (ref.: 16 years old):				
17 years old	0.00	0.43	-0.03	-0.17
	(0.12)	(0.40)	(0.18)	(0.87)
18 years old	-0.00	-0.18	-0.13	-0.86
	(0.15)	(0.46)	(0.21)	(0.89)
Type of compulsory school (ref.: Public):				
Private	-0.51	1.34	-1.37***	-‡
	(0.48)	(1.17)	(0.32)	-
Semi-private	-0.22*	0.23	-0.16	1.32*
	(0.12)	(0.45)	(0.25)	(0.71)
Father's education (ref.: Primary or less):				
Compulsory	-0.02	1.07	-0.82**	-0.41
	(0.21)	(0.69)	(0.33)	(1.35)
High school	-0.07	1.21*	-0.70	-1.14
	(0.23)	(0.70)	(0.44)	(1.35)
Tertiary	-0.30	1.29	-1.06**	-0.28
	(0.30)	(0.87)	(0.40)	(1.59)

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Table 7: (continued)

Dependent variable: Months worked while enrolled				
	1^{st} GRADE		2^{nd} GRADE	
	First Time	Repeaters	First Time	Repeaters
"Don't know"	-0.49	0.74	-1.71***	-1.32
	(0.35)	(0.75)	(0.48)	(1.64)
Mother's education (ref.: Primary or less):				
Compulsory	0.16	-0.40	0.41*	1.15
	(0.23)	(0.61)	(0.24)	(0.93)
High school	0.09	-0.86	0.91***	-0.17
	(0.27)	(0.66)	(0.32)	(1.11)
Tertiary	0.46	-0.65	0.74	3.12*
	(0.39)	(1.05)	(0.46)	(1.70)
"Don't know"	0.83**	-0.92	1.72***	1.49
	(0.37)	(0.59)	(0.49)	(1.54)
Provincial per capita income[†]	-0.02	0.06	0.07	0.37
	(0.04)	(0.10)	(0.06)	(0.23)
Constant	-0.55	-0.68	0.58	-0.94
	(0.49)	(1.78)	(0.66)	(3.31)
Individuals	1573	261	876	104
Summary statistics from the first-stage estimation				
R-squared	0.031	0.111	0.070	0.177
Partial R-squared excluding instruments	0.021	0.108	0.065	0.162
F-test of joint significance of instruments	14.15***	0.51	4.59***	3.15*
(p-value)	(0.00)	(0.60)	(0.01)	(0.06)

OLS estimates. Standard errors clustered by province in parenthesis. Significance levels: *** 1%; ** 5%; * 10%.
[‡]Regressor not included to avoid multicollinearity. [†]Provincial income in thousands of euros

Table 8: Determinants of performance in Academic high school (average marginal effects)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Months worked	-0.18***	0.10***	0.08***	0.05	0.01	-0.06	-0.01	0.01	0.00	-0.02
	(0.03)	(0.03)	(0.02)	(0.07)	(0.04)	(0.07)	(0.03)	(0.03)	(0.01)	(0.03)
First-stage residuals	0.17***	-0.10***	-0.07***	-0.07	-0.00	0.07	0.00	-0.01	0.00	0.04
	(0.03)	(0.03)	(0.02)	(0.07)	(0.04)	(0.06)	(0.03)	(0.03)	(0.01)	(0.03)
Female	0.06***	-0.03***	-0.03***	0.07**	-0.00	-0.07**	0.06***	-0.05***	-0.01***	-0.05**
	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.03)	(0.01)	(0.01)	(0.00)	(0.03)
Entry delay	0.18***	-0.12***	-0.05***	-0.28	-0.07***	0.35	0.05	-0.02	-0.03***	-[‡]
	(0.02)	(0.02)	(0.01)	(2.88)	(0.02)	(2.87)	(0.10)	(0.10)	(0.00)	-
Private high school	0.14***	-0.09***	-0.05***	0.19**	-0.06	-0.13***	0.14***	-0.12***	-0.02***	0.07*
	(0.01)	(0.01)	(0.01)	(0.08)	(0.09)	(0.04)	(0.02)	(0.02)	(0.01)	(0.04)
First-grade repeater	-	-	-	-	-	-	-0.29***	0.27***	0.02*	0.54***
	-	-	-	-	-	-	(0.02)	(0.03)	(0.01)	(0.04)
Program field (ref.: Social Sciences):										
Arts	0.08***	-0.05***	-0.03***	-0.00	0.02	-0.02	-0.02	0.01	0.01	0.15*
	(0.02)	(0.02)	(0.01)	(0.07)	(0.06)	(0.06)	(0.03)	(0.03)	(0.01)	(0.08)
Health and Natural Sc.	0.03**	-0.01	-0.02*	0.03	-0.02	-0.01	-0.01	0.02	-0.01	-0.04
	(0.01)	(0.01)	(0.01)	(0.04)	(0.02)	(0.04)	(0.02)	(0.02)	(0.01)	(0.03)
Technology	0.02	-0.02*	-0.00	0.03	0.00	-0.03	0.03	-0.01	-0.02***	-0.03
	(0.01)	(0.01)	(0.01)	(0.05)	(0.03)	(0.06)	(0.02)	(0.02)	(0.01)	(0.03)
Age when finished comp. education (ref.: 16 years old):										
17 years old	-0.14***	0.06***	0.08***	-0.15***	0.06**	0.09***	-0.21***	0.17***	0.04***	0.07**
	(0.02)	(0.02)	(0.01)	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	(0.01)	(0.03)
18 years old	-0.09***	-0.02	0.11***	-0.11	0.05	0.06	-0.25***	0.15***	0.10***	0.13*
	(0.03)	(0.02)	(0.03)	(0.27)	(0.32)	(0.18)	(0.05)	(0.04)	(0.04)	(0.07)
Type of compulsory school (ref.: Public):										
Private	-0.02	0.00	0.02	-0.13	-0.07***	0.20	0.01	-0.01	0.00	0.03
	(0.02)	(0.03)	(0.02)	(0.18)	(0.02)	(0.18)	(0.05)	(0.04)	(0.06)	(0.08)
Semi-private	-0.07***	0.05***	0.02**	-0.02	0.00	0.02	-0.00	-0.00	0.00	-0.02
	(0.01)	(0.01)	(0.01)	(0.04)	(0.02)	(0.04)	(0.02)	(0.02)	(0.01)	(0.03)

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Table 8: (continued)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Father's education (ref.: Primary or less):										
Compulsory	0.04*	-0.04**	0.00	-0.11	0.05	0.06	-0.00	0.02	-0.02	0.02
	(0.02)	(0.02)	(0.01)	(0.07)	(0.07)	(0.06)	(0.03)	(0.03)	(0.01)	(0.05)
High school	0.05**	-0.03	-0.02	0.01	-0.00	-0.00	0.01	0.00	-0.02***	0.00
	(0.02)	(0.02)	(0.01)	(0.09)	(0.06)	(0.08)	(0.03)	(0.03)	(0.01)	(0.05)
Tertiary	0.07***	-0.03*	-0.03***	-0.07	0.08	-0.01	0.06**	-0.03	-0.03***	-0.01
	(0.02)	(0.02)	(0.01)	(0.10)	(0.11)	(0.08)	(0.03)	(0.03)	(0.01)	(0.06)
"Don't know"	0.00	0.01	-0.01	-0.12	0.09	0.03	-0.01	0.02	-0.01	0.03
	(0.03)	(0.03)	(0.02)	(0.12)	(0.13)	(0.09)	(0.04)	(0.04)	(0.01)	(0.08)
Mother's education (ref.: Primary or less):										
Compulsory	0.01	-0.00	-0.01	0.07	-0.00	-0.06	0.01	-0.00	-0.01	-0.04
	(0.02)	(0.02)	(0.01)	(0.11)	(0.14)	(0.07)	(0.03)	(0.02)	(0.01)	(0.06)
High school	0.03	-0.00	-0.03**	0.04	0.04	-0.08	-0.00	0.00	-0.00	-0.08
	(0.02)	(0.02)	(0.01)	(0.15)	(0.19)	(0.07)	(0.03)	(0.03)	(0.01)	(0.06)
Tertiary	0.09***	-0.04*	-0.05***	0.03	0.08	-0.12*	0.05*	-0.05*	0.00	-0.05
	(0.02)	(0.02)	(0.01)	(0.21)	(0.24)	(0.06)	(0.03)	(0.03)	(0.01)	(0.07)
"Don't know"	-0.01	-0.00	0.02	0.01	0.00	-0.01	-0.06	0.06	-0.00	-0.05
	(0.03)	(0.03)	(0.02)	(0.13)	(0.15)	(0.08)	(0.04)	(0.04)	(0.01)	(0.09)
Provincial p.c. income[†]	0.01	-0.01**	0.00	0.01	0.00	-0.01	0.00	-0.00	0.00	0.02**
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Individuals		6310			799			5601		1278
Log-likelihood		-3507.67			-549.68			-3215.94		-691.02

Control function estimates. Marginal effects obtained from multinomial logit estimates for first grade and first time in second grade, and from binary logit estimates for second-grade repeaters. Bootstrapped standard errors in parenthesis. Significance levels: *** 1%; ** 5%; * 10%. [‡]Regressor not included to avoid multicollinearity.
[†]Provincial income expressed in thousands of euros.

Table 9: Determinants of performance in Vocational high school (average marginal effects)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Months worked	-0.08**	0.00	0.08**	0.06	-0.14	0.08	-0.09	0.01	0.09	-0.05
	(0.04)	(0.04)	(0.04)	(0.27)	(0.26)	(0.19)	(0.08)	(0.05)	(0.06)	(0.28)
First-stage residuals	0.07*	-0.01	-0.06	-0.08	0.14	-0.06	0.09	-0.01	-0.08	0.08
	(0.04)	(0.04)	(0.04)	(0.26)	(0.27)	(0.19)	(0.08)	(0.06)	(0.06)	(0.29)
Female	0.01	-0.00	-0.01	0.05	0.08	-0.12	0.04	-0.05	0.01	-0.12
	(0.03)	(0.03)	(0.03)	(0.14)	(0.15)	(0.11)	(0.04)	(0.03)	(0.04)	(1.17)
Entry delay	0.11***	-0.05**	-0.05**	0.08	-0.01	-0.08	0.03	0.01	-0.04	0.26
	(0.03)	(0.02)	(0.02)	(0.51)	(0.57)	(0.18)	(0.05)	(0.04)	(0.03)	(0.26)
Private high school	0.07**	0.02	-0.09***	0.03	0.11	-0.14	0.03	0.02	-0.05*	-0.06
	(0.03)	(0.03)	(0.02)	(0.20)	(0.21)	(0.09)	(0.05)	(0.04)	(0.03)	(0.20)
First-grade repeater	-	-	-	-	-	-	-0.11**	0.11**	-0.00	0.31
	-	-	-	-	-	-	(0.05)	(0.05)	(0.03)	(0.25)
One-grade program	-0.18***	0.22***	-0.04	0.10	0.08	-0.18**	-	-	-	-
	(0.04)	(0.04)	(0.03)	(0.18)	(0.17)	(0.08)	-	-	-	-
Program field (ref.: Clerical support):										
Agric., forestry and fishery	0.16**	-0.05	-0.11***	-‡	-‡	-‡	-0.15	-0.12***	0.28	-‡
	(0.06)	(0.06)	(0.03)	-	-	-	(1.01)	(0.02)	(1.02)	-
Electrical, electronic trades	0.03	0.01	-0.04	0.18	-0.11	-0.07	-0.23**	0.11	0.13	-0.11
	(0.04)	(0.04)	(0.03)	(0.19)	(0.18)	(0.17)	(0.11)	(0.09)	(0.11)	(0.89)
Machinery and building	0.11***	-0.03	-0.08***	0.15	-0.09	-0.07	-0.18	0.04	0.14	-0.06
	(0.04)	(0.04)	(0.03)	(0.21)	(0.19)	(0.17)	(0.11)	(0.07)	(0.10)	(1.01)
Textile, wood, handicraft	-0.02	0.05	-0.03	-‡	-‡	-‡	-0.11	0.03	0.08	-‡
	(0.06)	(0.06)	(0.05)	-	-	-	(0.69)	(0.41)	(0.49)	-
Social services	0.10***	-0.01	-0.09***	0.12	-0.11	-0.01	-0.05	0.08	-0.03	-0.22
	(0.03)	(0.03)	(0.02)	(0.19)	(0.19)	(0.15)	(0.06)	(0.06)	(0.03)	(0.86)
Age when finished comp. education (ref.: 16 years old):										
17 years old	-0.08***	0.02	0.06***	-0.17	0.09	0.08	-0.05**	0.03*	0.02	-0.12
	(0.03)	(0.02)	(0.02)	(0.17)	(0.19)	(0.10)	(0.02)	(0.02)	(0.02)	(0.10)
18 years old	-0.17***	0.01	0.16***	-0.21	0.09	0.12	-0.09*	0.01	0.08*	-0.13
	(0.04)	(0.03)	(0.04)	(0.21)	(0.27)	(0.16)	(0.05)	(0.04)	(0.04)	(0.31)

(*continued on next page*)

Table 9: (continued)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Type of compulsory school (ref.: Public):										
Private	-0.01	0.11	-0.10	-0.29	0.49	-0.20**	0.07	-0.01	-0.06**	-‡
	(0.26)	(0.15)	(0.37)	(2.24)	(2.23)	(0.09)	(0.66)	(0.66)	(0.02)	-
Semi-private	-0.05	-0.01	0.05*	-0.03	-0.03	0.05	0.04	0.01	-0.05	0.24
	(0.03)	(0.03)	(0.03)	(0.25)	(0.30)	(0.11)	(0.04)	(0.03)	(0.05)	(0.42)
Father's education (ref.: Primary or less):										
Compulsory	0.05	-0.03	-0.03	0.12	0.00	-0.13	-0.07	0.03	0.04	-0.10
	(0.04)	(0.03)	(0.04)	(0.24)	(0.18)	(0.19)	(0.09)	(0.07)	(0.06)	(0.34)
High school	0.08	-0.03	-0.05	0.11	0.06	-0.17	-0.08	0.04	0.04	-0.06
	(0.05)	(0.04)	(0.04)	(0.74)	(0.76)	(0.22)	(0.11)	(0.09)	(0.06)	(0.39)
Tertiary	0.04	-0.05	0.01	0.20	-0.09	-0.12	-0.21	0.13	0.08	-0.32
	(0.06)	(0.04)	(0.05)	(0.26)	(0.18)	(0.21)	(0.31)	(0.17)	(0.37)	(0.54)
"Don't know"	-0.02	-0.07	0.09	0.01	0.09	-0.10	-0.23	-0.00	0.23	-0.26
	(0.07)	(0.04)	(0.07)	(0.31)	(0.31)	(0.14)	(0.28)	(0.12)	(0.28)	(0.46)
Mother's education (ref.: Primary or less):										
Compulsory	0.06	-0.01	-0.04	0.00	0.01	-0.02	0.03	-0.04	0.01	-0.06
	(0.04)	(0.04)	(0.03)	(0.22)	(0.23)	(0.12)	(0.06)	(0.05)	(0.04)	(0.32)
High school	0.03	-0.02	-0.01	0.12	-0.06	-0.06	0.09	-0.07	-0.02	0.16
	(0.06)	(0.04)	(0.04)	(0.45)	(0.27)	(0.41)	(0.07)	(0.05)	(0.04)	(0.41)
Tertiary	0.04	0.04	-0.08**	0.07	-0.10	0.03	0.11	-0.08*	-0.03	0.52
	(0.07)	(0.06)	(0.04)	(0.84)	(0.21)	(0.83)	(0.13)	(0.04)	(0.14)	(0.84)
"Don't know"	0.01	0.11	-0.11***	0.12	-0.09	-0.03	0.11	-0.03	-0.08	-0.01
	(0.07)	(0.08)	(0.03)	(0.25)	(0.24)	(0.18)	(0.12)	(0.10)	(0.06)	(0.71)
Provincial p.c. income†	0.01	-0.01	-0.00	0.01	0.00	-0.02	-0.00	0.01	-0.01	-0.04
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.12)
Individuals		1573			261			876		104
Log-likelihood		-1226.51			-155.13			-469.28		-49.35

Control function estimates. Marginal effects obtained from multinomial logit estimates for first grade and first time in second grade, and from binary logit estimates for second-grade repeaters. Bootstrapped standard errors in parenthesis. Significance levels: *** 1%; ** 5%; * 10%. ‡Regressor not included to avoid multicollinearity.
†Provincial income expressed in thousands of euros.

Table 10: The effect of working during high school on performance (average marginal effects)

A. Academic high school

	1^{st} GRADE						2^{nd} GRADE			
	First Time (N=6310)			Repeaters (N=799)			First Time (N=5601)			Repeaters (N=1278)
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Logit	-0.02***	0.01**	0.01***	-0.02***	0.01***	0.01*	-0.01***	0.01**	0.00***	0.02***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
CF	-0.18***	0.10***	0.08***	0.05	0.01	-0.06	-0.01	0.01	0.00	-0.02
	(0.03)	(0.03)	(0.02)	(0.07)	(0.04)	(0.07)	(0.03)	(0.03)	(0.01)	(0.03)

B. Vocational high school

	1^{st} GRADE						2^{nd} GRADE			
	First Time (N=1573)			Repeaters (N=261)			First Time (N=876)			Repeaters (N=104)
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Logit	-0.01***	-0.01***	0.02***	-0.02*	-0.00	0.02***	-0.00	-0.00	0.01**	0.02*
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
CF	-0.08**	0.00	0.08**	0.06	-0.14	0.08	-0.09	0.01	0.09	-0.05
	(0.04)	(0.04)	(0.04)	(0.27)	(0.26)	(0.19)	(0.08)	(0.05)	(0.06)	(0.28)

Average marginal effect (AME) of the number of school months worked on schooling outcomes. Logit: AME obtained from multinomial and binary logit estimates without controlling for the endogeneity of school months worked (standard errors clustered by province in parenthesis). CF: AME obtained from multinomial and binary logit estimates controlling for the endogeneity of school months worked using the control function method (bootstrapped standard errors in parenthesis). Significance levels: *** 1%; ** 5%; * 10%.

Table 11: Robustness checks: effect of working while enrolled

A. Academic high school

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time	Repeaters		
	Passing	Repeating	Dropp. out	Passing	Repeating	Dropp. out	Passing	Repeating	Dropp. out	No diploma
Without controlling for first-grade repeater								[N=5601]		[N=1278]
		-			-		-0.05**	0.05*	0.00	0.03
							(0.03)	(0.03)	(0.01)	(0.04)
Sample restrictions:										
First-grade repeater= 0								[N=5022]		[N=970]
		-			-		-0.03	0.04	-0.00	-0.02
							(0.02)	(0.02)	(0.01)	(0.03)
Entry delay= 0		[N=6245]			[N=797]			[N=5581]		[N=1271]
	-0.19***	0.10***	0.08***	0.04	0.01	-0.05	-0.01	0.01	0.00	-0.02
	(0.03)	(0.02)	(0.02)	(0.07)	(0.04)	(0.07)	(0.03)	(0.03)	(0.01)	(0.03)
16 years old		[N=5230]			[N=582]			[N=4854]		[N=971]
	-0.18***	0.10***	0.07***	0.08	-0.00	-0.08	-0.02	0.02	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.07)	(0.04)	(0.06)	(0.03)	(0.03)	(0.01)	(0.03)

B. Vocational high school

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time	Repeaters		
	Passing	Repeating	Dropp. out	Passing	Repeating	Dropp. out	Passing	Repeating	Dropp. out	No diploma
Without controlling for first-grade repeater								[N=876]		[N=104]
		-			-		-0.10	0.01	0.09	-0.08
							(0.08)	(0.05)	(0.07)	(0.19)
Sample restrictions:										
First-grade repeater= 0								[N=796]		[N=85]
		-			-		-0.16	0.05	0.11	-0.05
							(0.12)	(0.08)	(0.08)	(36.40)
Entry delay= 0		[N=1167]			[N=209]			[N=702]		[N=84]
	-0.14**	0.01	0.13**	-0.02	-0.09	0.11	-0.04	-0.03	0.06	-0.27
	(0.06)	(0.05)	(0.06)	(0.20)	(0.20)	(0.14)	(0.06)	(0.05)	(0.05)	(31.03)
16 years old		[N=583]			[N=85]			[N=331]		[N=34]
	-0.09	0.03	0.06	-	-	-	-0.26	0.02	0.24	-
	(0.07)	(0.05)	(0.05)	-	-	-	(1.32)	(0.22)	(1.47)	-

Average marginal effect (AME) of the number of school months worked on schooling outcomes obtained using the CF method (bootstrapped standard errors in parenthesis).
Significance levels: *** 1%; ** 5%; * 10%. Sample sizes are shown in brackets.

Appendices

A Sample selection

The initial sample contains 8098 individuals. I drop:

- 26 individuals who finished compulsory schooling older than 18 years old. The Spanish schooling system allows students in compulsory education to repeat whole grades up to twice. Therefore, the maximum age to finish compulsory education is 18 years old. According to this, a recorded age above eighteen is not possible and, so, it is considered as a measurement error.

- 44 individuals who report a non-Spanish nationality. Since they are so few individuals and the survey does not provide the year when they entered the Spanish education system, in order to avoid misleading results, I decide to not include them in the final sample.

- 43 individuals who choose artistic education (dance or music) after completing compulsory education. The artistic track is a complete separate path with respect to academic and vocational high school, with their own admission and progression rules, and it is usually chosen by individuals who followed some type of artistic education during compulsory schooling.

- 40 individuals who have inconsistent responses over the survey. For example, some of them are observed attending university but previously they do not report having obtained a high school diploma. Other individuals report to be enrolled in second grade of high school, but they are not observed in first grade in previous years.

With these rules, I eliminate 153 individuals, representing only around 1.9% of the initial sample. In addition, I drop those individuals for whom it is not possible to construct their history of high school performance. This is the case for 48 and 80 individuals enrolled, respectively, in first grade of the academic track and in first grade of a two-grade vocational program during 2004/2005, the last school year in the sample (for more details, see Subsection 3.2). In total, I drop 281 individuals (around 3.5% of the initial sample).

B Definition of variables

B.1 Explanatory variables:

- **Female.** Dummy variable equal to one if an individual is a female.

- **Parents' education.** Four dummy variables indicating the schooling level of each parent: primary or less, compulsory, high school (academic or vocational), and tertiary (university

or vocational college). I also include a dummy for the category *don't know* because Table 1 shows that there is an important percentage of individuals who do not report or do not know the schooling level of their parents.

- **Age when a student finished compulsory education.** Three dummy variables equal to one if an individual finished compulsory education with sixteen, seventeen or eighteen years old, respectively.

- **Type of school in compulsory education.** Three dummy variables that take the value one if a student finished compulsory education, respectively, in a public, semi-private or private school.

- **Entry delay.** Dummy variable equal to one if an individual enrolled in academic or vocational high school did not attend that track the year following compulsory schooling.

- **Private high school.** Dummy variable equal to one if an individual attends the grade in a private high school. This dummy also includes semi-private institutions because the questionnaire does not allow distinguishing both categories in the high school level. Thus, the variable is equal to zero if an individual attends a public high school.

- **Program field.** Dummy variables indicating the field that an individual chooses in each grade. In the academic track, I consider four categories, according to the specialization fields available: Arts; Health and Natural Sciences; Technology; and Social Sciences. In the vocational track, the range of programs available is higher and I group them into the following six categories: Agriculture, forestry and fishery; Electrical and electronic trades; Clerical support; Machinery and building; Textile, wood and handicraft; and Social services.

- **First-grade repeater.** Dummy variable equal to one if an individual repeated first grade.

- **One-grade program.** Dummy variable equal to one if an individual attends a vocational program of one grade.

- **Working activity.** The survey provides a monthly calendar with individual's employment status. In particular, a person is considered to have a job in a month if, she worked for at least two consecutive weeks with the same employer, and she received a wage. This definition reduces measurement error in the actual labor activity during the school year because it excludes holiday jobs. In addition, it also rules out the possibility that the module of workplace training is considered as a working period because trainees do not receive wages. The working activity variable is the total number of school months that an individual had a job, according to the information reported in her calendar.

- **Provincial per capita income.** Annual per capita household gross disposable income in the student's province of residence in the school year $t/t+1$, measured in real euros. I obtain this information from the Spanish Regional Accounts from 2001 to 2005 (base 2000) produced by the Spanish Statistics Institute. The series is deflated with the annual CPI by province. Then, I average per capita household income of years t and $t+1$ to obtain a measure that corresponds with the school year $t/t+1$. Note that each step of the analysis considers the pool of students attending a given grade, so each student is matched to the value of the provincial per capita income corresponding to the year she is enrolled in that grade.

B.2 Instrumental variables:

- **Provincial youth activity rate.** Provincial activity rate in year t of individuals aged less than twenty-five years old. Each individual attending a given grade in the school year $t/t+1$ is matched to the activity rate corresponding to her province of residence in year t. Information on activity rates between 2001 and 2004 is available from the Labor Force Survey at the website of the Spanish Statistics Institute.

- **Provincial distribution of tourists.** Ratio of tourists in the province during school months with respect to the total number of tourists in Spain during the same period. Information on tourists at the province level is obtained from the 2001-2005 Hotel Occupancy Survey produced by the Spanish Statistics Institute. In particular, this survey contains, on a monthly basis, the number of individuals who spent at least one night in a hotel of the province. Using these data, I calculate the total number of tourists between October and May for each province and for Spain. Then, I obtain the provincial distribution of tourists during the school months of each academic year between 2001/2002 and 2004/2005. Each student attending a given grade in the school year $t/t+1$ is matched to the value of that variable in $t/t+1$ in her province of residence.

Table B.1: Descriptive statistics of explanatory variables, by schooling outcomes and grade (Academic high school)

	1^{st} GRADE						2^{nd} GRADE				
	First Time			Repeaters			First Time			Repeaters	
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Diploma	No diploma
Female	0.57	0.51	0.47	0.54	0.48	0.44	0.58	0.53	0.49	0.54	0.50
Father's education:											
Primary or less	0.06	0.12	0.13	0.12	0.05	0.14	0.06	0.09	0.18	0.08	0.10
Compulsory	0.38	0.40	0.52	0.39	0.38	0.45	0.37	0.43	0.42	0.44	0.42
High school	0.19	0.17	0.12	0.19	0.11	0.12	0.19	0.19	0.16	0.20	0.18
Tertiary	0.28	0.17	0.08	0.18	0.29	0.12	0.30	0.18	0.07	0.18	0.18
Don't know	0.08	0.14	0.14	0.13	0.18	0.17	0.08	0.12	0.16	0.11	0.13
Mother's education:											
Primary or less	0.07	0.12	0.15	0.11	0.07	0.15	0.07	0.09	0.16	0.08	0.11
Compulsory	0.44	0.46	0.54	0.47	0.36	0.50	0.43	0.48	0.45	0.48	0.48
High school	0.20	0.20	0.14	0.21	0.25	0.15	0.20	0.20	0.16	0.22	0.18
Tertiary	0.23	0.12	0.05	0.12	0.21	0.07	0.25	0.13	0.11	0.14	0.12
Don't know	0.06	0.10	0.13	0.09	0.11	0.13	0.05	0.09	0.11	0.08	0.10
Age when finished compulsory education:											
16 years old	0.88	0.73	0.49	0.77	0.57	0.64	0.91	0.76	0.56	0.79	0.71
17 years old	0.10	0.23	0.34	0.19	0.36	0.31	0.07	0.19	0.30	0.17	0.22
18 years old	0.02	0.05	0.17	0.04	0.07	0.04	0.02	0.05	0.14	0.04	0.06
Entry delay	0.01	0.00	0.05	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01
Type of school (compulsory education):											
Private	0.05	0.02	0.03	0.02	0.00	0.04	0.06	0.03	0.03	0.03	0.03
Semi-private	0.39	0.34	0.28	0.35	0.32	0.31	0.41	0.30	0.27	0.30	0.29
Public	0.56	0.64	0.69	0.63	0.68	0.66	0.53	0.67	0.70	0.67	0.68
Type of high school:											
Private	0.30	0.13	0.10	0.14	0.04	0.06	0.33	0.14	0.11	0.11	0.12
Public	0.70	0.87	0.90	0.86	0.96	0.94	0.67	0.86	0.89	0.89	0.88
Type of program:											
Arts	0.03	0.03	0.04	0.06	0.09	0.06	0.03	0.05	0.09	0.03	0.07
Natural Sciences	0.35	0.30	0.23	0.26	0.20	0.24	0.35	0.32	0.24	0.36	0.29
Technology	0.19	0.16	0.17	0.15	0.16	0.13	0.20	0.16	0.09	0.16	0.15
Social Sciences	0.43	0.51	0.56	0.53	0.55	0.57	0.43	0.47	0.59	0.45	0.50
First-grade repeater	-	-	-	-	-	-	0.06	0.24	0.24	0.08	0.49
School months worked	0.29	0.48	1.34	0.59	1.43	0.93	0.37	0.59	1.46	0.71	1.47
	(1.39)	(1.79)	(2.61)	(1.98)	(2.81)	(2.16)	(1.56)	(1.92)	(2.52)	(2.03)	(2.62)
Provincial per capita income*	10.39	10.34	10.52	10.53	10.70	10.30	10.59	10.54	10.62	10.64	10.96
	(1.63)	(1.66)	(1.69)	(1.60)	(1.76)	(1.57)	(1.62)	(1.58)	(1.66)	(1.57)	(1.55)
Sample size	5040	799	471	580	56	163	4171	1278	152	766	512

Means of the variables considered in the analysis and standard deviation in parentheses. *Provincial income is expressed in thousands of euros.

Table B.2: Descriptive statistics of explanatory variables, by schooling outcomes and grade (Vocational high school)

	1^{st} GRADE						2^{nd} GRADE				
	First Time			Repeaters			First Time			Repeaters	
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Diploma	No diploma
Female	0.42	0.48	0.40	0.51	0.55	0.39	0.38	0.25	0.25	0.32	0.15
Father's education:											
Primary or less	0.12	0.17	0.17	0.13	0.32	0.25	0.12	0.11	0.13	0.10	0.12
Compulsory	0.50	0.47	0.46	0.49	0.32	0.47	0.49	0.44	0.47	0.48	0.39
High school	0.16	0.12	0.11	0.14	0.09	0.06	0.15	0.16	0.17	0.13	0.22
Tertiary	0.08	0.07	0.07	0.07	0.00	0.06	0.08	0.12	0.06	0.13	0.10
Don't know	0.15	0.17	0.19	0.16	0.27	0.16	0.17	0.17	0.17	0.17	0.17
Mother's education:											
Primary or less	0.15	0.17	0.20	0.14	0.23	0.25	0.15	0.16	0.11	0.14	0.20
Compulsory	0.56	0.50	0.50	0.52	0.45	0.49	0.54	0.53	0.57	0.60	0.41
High school	0.13	0.10	0.12	0.11	0.09	0.06	0.12	0.10	0.15	0.06	0.15
Tertiary	0.05	0.06	0.04	0.07	0.00	0.04	0.06	0.05	0.04	0.02	0.10
Don't know	0.11	0.16	0.14	0.16	0.23	0.16	0.13	0.16	0.13	0.17	0.15
Age when finished compulsory education:											
16 years old	0.41	0.33	0.25	0.39	0.14	0.18	0.39	0.33	0.28	0.29	0.39
17 years old	0.40	0.43	0.41	0.41	0.36	0.55	0.42	0.49	0.42	0.49	0.49
18 years old	0.19	0.24	0.33	0.20	0.50	0.27	0.19	0.18	0.30	0.22	0.12
Entry delay	0.29	0.21	0.19	0.23	0.05	0.16	0.20	0.19	0.13	0.13	0.29
Type of school (compulsory education):											
Private	0.02	0.03	0.00	0.03	0.05	0.00	0.02	0.01	0.00	0.00	0.02
Semi-private	0.26	0.23	0.25	0.23	0.09	0.25	0.26	0.28	0.08	0.22	0.37
Public	0.73	0.74	0.75	0.73	0.86	0.75	0.72	0.71	0.92	0.78	0.61
One-grade program	0.20	0.52	0.26	0.55	0.73	0.25	-	-	-	-	-
Type of high school:											
Private	0.22	0.21	0.10	0.23	0.18	0.10	0.22	0.27	0.11	0.32	0.22
Public	0.78	0.79	0.90	0.77	0.82	0.90	0.78	0.73	0.89	0.68	0.78
Type of program:											
Clerical support	0.25	0.35	0.37	0.34	0.36	0.37	0.21	0.10	0.15	0.10	0.10
Agriculture, forestry and fishery	0.03	0.02	0.02	0.02	0.05	0.02	0.03	0.00	0.04	0.00	0.00
Electrical and electronic trades	0.16	0.16	0.19	0.16	0.09	0.16	0.17	0.31	0.21	0.29	0.34
Machinery and building	0.24	0.15	0.20	0.14	0.14	0.16	0.27	0.29	0.40	0.22	0.39
Textile, wood and handicraft	0.03	0.04	0.03	0.03	0.05	0.08	0.04	0.03	0.04	0.03	0.02
Social services	0.29	0.28	0.20	0.30	0.32	0.22	0.28	0.28	0.17	0.37	0.15
First-grade repeater	-	-	-	-	-	-	0.08	0.18	0.11	0.11	0.29
School months worked	0.81	0.68	1.85	1.43	0.82	2.12	1.33	1.17	2.15	1.81	2.71
	(2.21)	(2.07)	(2.76)	(2.63)	(1.99)	(3.17)	(2.59)	(2.59)	(2.94)	(2.90)	(3.17)
Provincial per capita income*	10.50	10.27	10.26	10.53	10.31	10.18	10.58	10.98	10.60	11.31	11.01
	(1.61)	(1.60)	(1.54)	(1.58)	(1.57)	(1.50)	(1.54)	(1.73)	(1.65)	(1.72)	(1.78)
Sample size	1050	266	257	188	22	51	719	104	53	63	41

Means of the variables considered in the analysis and standard deviation in parentheses. *Provincial income is expressed in thousands of euros.

C Results without controlling for endogeneity

Table C.1: Multinomial and binary logit estimates for performance in Academic high school (average marginal effects)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Months worked	-0.02***	0.01**	0.01***	-0.02***	0.01***	0.01*	-0.01***	0.01**	0.00***	0.02***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Female	0.06***	-0.03***	-0.03***	0.08***	-0.00	-0.08***	0.06***	-0.05***	-0.01***	-0.05
	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.03)	(0.01)	(0.01)	(0.00)	(0.03)
Entry delay	0.04	-0.11***	0.06	-0.33	-0.07***	0.40	0.04	-0.01	-0.03***	-[‡]
	(0.05)	(0.01)	(0.04)	(0.29)	(0.01)	(0.29)	(0.08)	(0.08)	(0.00)	-
Private high school	0.15***	-0.09***	-0.05***	0.17***	-0.06***	-0.11***	0.14***	-0.12***	-0.02***	0.07
	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	(0.05)
First-grade repeater	-	-	-	-	-	-	-0.29***	0.27***	0.02**	0.52***
	-	-	-	-	-	-	(0.02)	(0.02)	(0.01)	(0.03)
Program field (ref.: Social Sciences):										
Arts	0.06**	-0.04*	-0.02**	0.00	0.02	-0.02	-0.02	0.01	0.01	0.09
	(0.03)	(0.02)	(0.01)	(0.06)	(0.04)	(0.06)	(0.03)	(0.03)	(0.01)	(0.06)
Health and Natural Sc.	0.03***	-0.02	-0.02**	0.04	-0.02	-0.02	-0.01	0.02	-0.01	-0.03
	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.03)
Technology	0.02**	-0.02**	-0.00	0.02	0.00	-0.02	0.03	-0.01	-0.02***	-0.02
	(0.01)	(0.01)	(0.01)	(0.04)	(0.02)	(0.04)	(0.02)	(0.02)	(0.00)	(0.04)
Age when finished comp. education (ref.: 16 years old):										
17 years old	-0.20***	0.09***	0.11***	-0.15***	0.06***	0.09***	-0.21***	0.17***	0.04***	0.08**
	(0.02)	(0.02)	(0.01)	(0.04)	(0.02)	(0.03)	(0.02)	(0.02)	(0.01)	(0.03)
18 years old	-0.25***	0.02	0.22***	-0.04	0.06	-0.02	-0.25***	0.15***	0.10***	0.14**
	(0.04)	(0.02)	(0.03)	(0.07)	(0.06)	(0.06)	(0.03)	(0.03)	(0.03)	(0.06)
Type of compulsory school (ref.: Public):										
Private	-0.02	0.00	0.02	-0.05	-0.07***	0.12	0.01	-0.01	0.00	0.04
	(0.05)	(0.03)	(0.03)	(0.08)	(0.01)	(0.08)	(0.04)	(0.03)	(0.02)	(0.08)
Semi-private	-0.06***	0.04***	0.02***	-0.03	0.00	0.03	-0.00	-0.00	0.00	-0.02
	(0.01)	(0.01)	(0.01)	(0.04)	(0.02)	(0.03)	(0.02)	(0.02)	(0.01)	(0.03)

(*continued on next page*)

Table C.1: (continued)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Father's education (ref.: Primary or less):										
Compulsory	0.04*	-0.04**	0.01	-0.07	0.05	0.02	-0.00	0.02	-0.02*	0.01
	(0.02)	(0.02)	(0.01)	(0.06)	(0.05)	(0.04)	(0.03)	(0.03)	(0.01)	(0.04)
High school	0.07***	-0.04**	-0.03***	0.04	-0.00	-0.04	0.01	0.00	-0.02***	-0.01
	(0.02)	(0.02)	(0.01)	(0.07)	(0.06)	(0.04)	(0.03)	(0.03)	(0.01)	(0.05)
Tertiary	0.08***	-0.04**	-0.04***	-0.03	0.08	-0.05	0.06*	-0.03	-0.03***	-0.02
	(0.02)	(0.02)	(0.01)	(0.09)	(0.09)	(0.06)	(0.03)	(0.03)	(0.01)	(0.05)
"Don't know"	0.00	0.00	-0.01	-0.11	0.09	0.01	-0.01	0.02	-0.01	-0.01
	(0.03)	(0.03)	(0.01)	(0.10)	(0.09)	(0.06)	(0.04)	(0.04)	(0.01)	(0.08)
Mother's education (ref.: Primary or less):										
Compulsory	0.04*	-0.01	-0.02**	0.04	-0.01	-0.04	0.01	-0.00	-0.00	-0.03
	(0.02)	(0.02)	(0.01)	(0.07)	(0.04)	(0.06)	(0.03)	(0.03)	(0.01)	(0.06)
High school	0.03*	-0.01	-0.03**	0.03	0.04	-0.07	-0.00	0.00	-0.00	-0.07
	(0.02)	(0.02)	(0.01)	(0.07)	(0.06)	(0.05)	(0.03)	(0.03)	(0.01)	(0.05)
Tertiary	0.10***	-0.05***	-0.05***	0.02	0.08	-0.11**	0.05*	-0.05*	0.00	-0.03
	(0.02)	(0.01)	(0.01)	(0.08)	(0.07)	(0.05)	(0.03)	(0.03)	(0.01)	(0.06)
"Don't know"	-0.00	-0.01	0.01	0.02	0.00	-0.02	-0.06	0.06	-0.00	-0.01
	(0.02)	(0.02)	(0.02)	(0.09)	(0.06)	(0.06)	(0.04)	(0.05)	(0.01)	(0.08)
Provincial p.c. income[†]	-0.00	0.00	0.00	0.01	0.00	-0.01	0.00	-0.00	0.00	0.01**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Individuals		6310			799			5601		1278
Log-likelihood		-3531.55			-550.36			-3215.99		-691.74

Marginal effects obtained from multinomial logit estimates for first grade and first time in second grade, and from binary logit estimates for second-grade repeaters. Standard errors clustered by province in parenthesis. Significance levels: *** 1%; ** 5%; * 10%. [‡]Regressor not included to avoid multicollinearity. [†]In thousands of euros.

Table C.2: Multinomial and binary logit estimates for performance in Vocational high school (average marginal effects)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Months worked	-0.01***	-0.01***	0.02***	-0.02*	-0.00	0.02***	-0.00	-0.00	0.01**	0.02*
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Female	0.02	-0.00	-0.02	0.08	0.02	-0.10*	0.05	-0.05	-0.00	-0.20
	(0.03)	(0.03)	(0.02)	(0.07)	(0.06)	(0.06)	(0.04)	(0.03)	(0.03)	(0.16)
Entry delay	0.09***	-0.05***	-0.04**	0.12	-0.08***	-0.04	0.01	0.01	-0.02	0.23*
	(0.02)	(0.02)	(0.02)	(0.08)	(0.03)	(0.07)	(0.03)	(0.03)	(0.02)	(0.14)
Private high school	0.07**	0.02	-0.09***	0.10*	0.02	-0.12***	-0.01	0.03	-0.02	-0.01
	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)	(0.10)
First-grade repeater	-	-	-	-	-	-	-0.13***	0.12**	0.01	0.29***
	-	-	-	-	-	-	(0.05)	(0.05)	(0.02)	(0.11)
One-grade program	-0.21***	0.23***	-0.02	0.09	0.10***	-0.19***	-	-	-	-
	(0.06)	(0.03)	(0.05)	(0.07)	(0.03)	(0.06)	-	-	-	-
Program field (ref.: Clerical support):										
Agric., forestry and fishery	0.16***	-0.05	-0.11***	-‡	-‡	-‡	0.09	-0.12***	0.03	-‡
	(0.05)	(0.05)	(0.03)	-	-	-	(0.06)	(0.01)	(0.06)	-
Electrical, electronic trades	0.03	0.01	-0.04	0.16**	-0.05	-0.11*	-0.13**	0.11	0.02	-0.04
	(0.05)	(0.04)	(0.03)	(0.07)	(0.04)	(0.06)	(0.06)	(0.07)	(0.03)	(0.15)
Machinery and building	0.10***	-0.03	-0.07***	0.10	0.02	-0.11	-0.08	0.04	0.04	-0.01
	(0.04)	(0.03)	(0.03)	(0.07)	(0.06)	(0.07)	(0.05)	(0.05)	(0.04)	(0.19)
Textile, wood, handicraft	0.02	0.04	-0.06	-‡	-‡	-‡	-0.05	0.03	0.01	-‡
	(0.07)	(0.06)	(0.04)	-	-	-	(0.12)	(0.10)	(0.05)	-
Social services	0.08***	-0.00	-0.08***	0.07	-0.01	-0.05	-0.07	0.09*	-0.02	-0.14
	(0.03)	(0.02)	(0.02)	(0.06)	(0.04)	(0.05)	(0.05)	(0.05)	(0.03)	(0.10)
Age when finished comp. education (ref.: 16 years old):										
17 years old	-0.08***	0.02	0.06*	-0.15***	0.04	0.10**	-0.04*	0.03	0.01	-0.11
	(0.03)	(0.02)	(0.03)	(0.06)	(0.04)	(0.05)	(0.02)	(0.02)	(0.02)	(0.07)
18 years old	-0.16***	0.01	0.15***	-0.24***	0.15***	0.09	-0.06*	0.01	0.05	-0.07
	(0.03)	(0.03)	(0.04)	(0.07)	(0.05)	(0.08)	(0.03)	(0.03)	(0.03)	(0.15)

(*continued on next page*)

Table C.2: (continued)

	1^{st} GRADE						2^{nd} GRADE			
	First Time			Repeaters			First Time			Repeaters
	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	Passing	Repeating	Dropping out	No diploma
Type of compulsory school (ref.: Public):										
Private	0.01	0.10	-0.11**	0.10	0.10	-0.20***	0.10	-0.03	-0.06***	-‡
	(0.08)	(0.06)	(0.05)	(0.21)	(0.20)	(0.02)	(0.08)	(0.09)	(0.01)	-
Semi-private	-0.04	-0.01	0.04**	-0.01	-0.05*	0.07	0.05	0.01	-0.05***	0.13
	(0.02)	(0.02)	(0.02)	(0.07)	(0.03)	(0.07)	(0.03)	(0.03)	(0.01)	(0.11)
Father's education (ref.: Primary or less):										
Compulsory	0.06	-0.03	-0.03	0.20**	-0.14***	-0.07	0.00	0.02	-0.03	-0.09
	(0.05)	(0.04)	(0.04)	(0.08)	(0.04)	(0.06)	(0.05)	(0.04)	(0.03)	(0.17)
High school	0.08	-0.03	-0.05	0.22***	-0.08***	-0.14**	-0.02	0.03	-0.02	0.00
	(0.06)	(0.04)	(0.03)	(0.07)	(0.02)	(0.06)	(0.07)	(0.06)	(0.03)	(0.18)
Tertiary	0.06	-0.05	-0.01	0.19***	-0.10***	-0.09	-0.10	0.12	-0.02	-0.32***
	(0.05)	(0.03)	(0.04)	(0.07)	(0.02)	(0.07)	(0.08)	(0.08)	(0.03)	(0.10)
"Don't know"	0.02	-0.07	0.05	0.09	-0.02	-0.07	0.02	-0.00	-0.02	-0.20
	(0.07)	(0.05)	(0.05)	(0.11)	(0.04)	(0.09)	(0.08)	(0.06)	(0.04)	(0.25)
Mother's education (ref.: Primary or less):										
Compulsory	0.05	-0.01	-0.04	-0.03	0.07	-0.04	-0.01	-0.03	0.04	-0.13
	(0.05)	(0.04)	(0.04)	(0.09)	(0.05)	(0.08)	(0.04)	(0.04)	(0.03)	(0.17)
High school	0.03	-0.02	-0.01	0.03	0.07	-0.10	0.00	-0.07*	0.06	0.20
	(0.05)	(0.04)	(0.03)	(0.11)	(0.09)	(0.07)	(0.06)	(0.03)	(0.06)	(0.22)
Tertiary	0.01	0.05	-0.06**	0.08	-0.09***	0.00	0.05	-0.07*	0.02	0.39
	(0.07)	(0.07)	(0.03)	(0.12)	(0.02)	(0.12)	(0.06)	(0.04)	(0.05)	(0.38)
"Don't know"	-0.05	0.13	-0.08***	0.06	0.02	-0.08	-0.02	-0.01	0.02	-0.10
	(0.09)	(0.09)	(0.03)	(0.10)	(0.06)	(0.08)	(0.07)	(0.05)	(0.07)	(0.28)
Provincial p.c. income†	0.01	-0.01	-0.00	0.02	-0.00	-0.02	-0.01	0.01**	-0.00	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Individuals		1573			261			876		104
Log-likelihood		-1227.88			-156.50			-471.41		-49.64

Marginal effects obtained from multinomial logit estimates for first grade and first time in second grade, and from binary logit estimates for second-grade repeaters. Standard errors clustered by province in parenthesis. Significance levels: *** 1%; ** 5%; * 10%. ‡Regressor not included to avoid multicollinearity. †In thousands of euros.

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11.09	Factor shares, the price markup, and the elasticity of substitution between capital and labor.	Xavier Raurich, Hector Sala	Setembre 2011